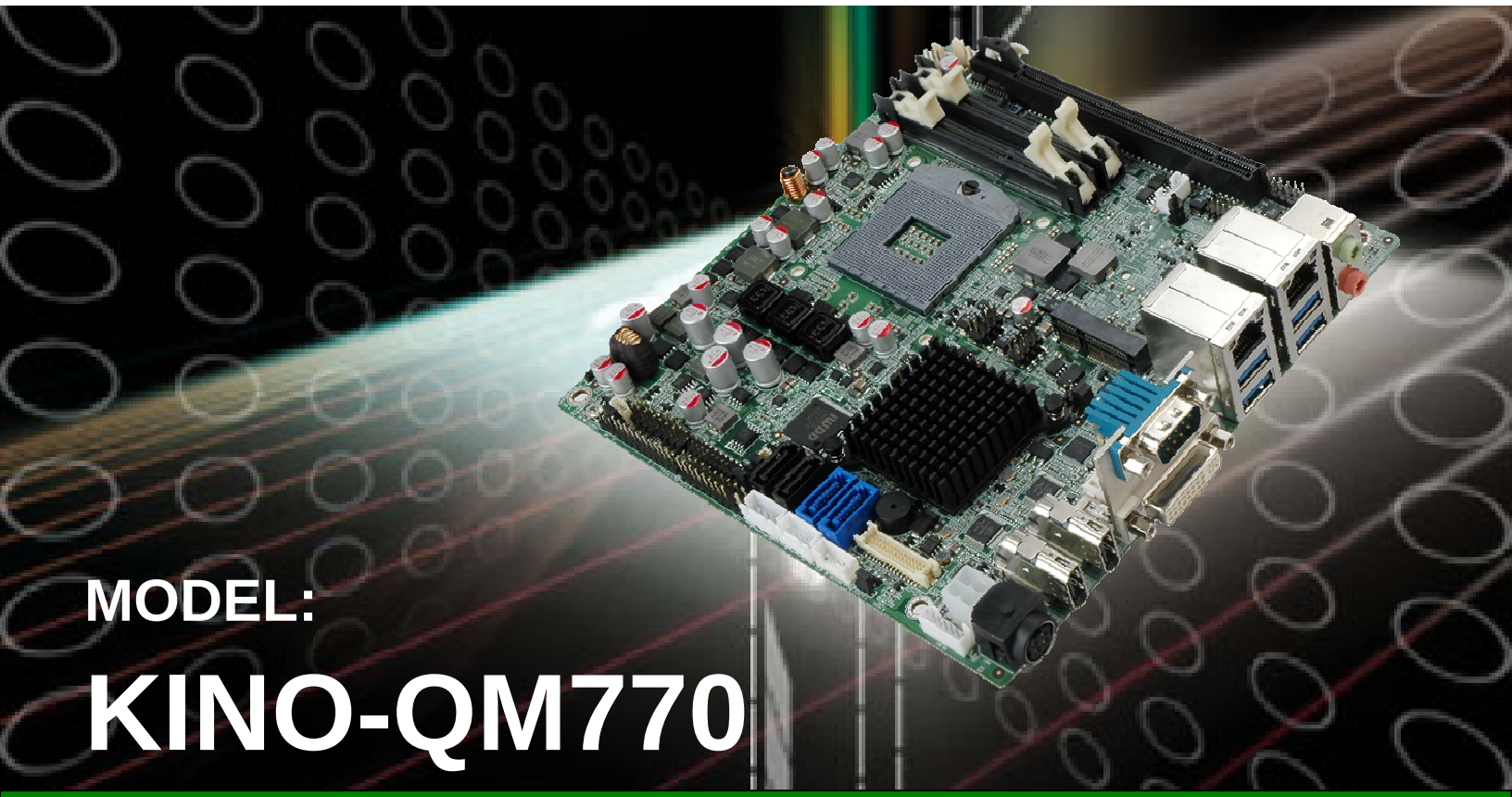
IEI Technology Corp.



MODEL:

KINO-QM770

Mini-ITX SBC with 3rd Generation 22nm Intel® Mobile CPU Up to 8.0 GB DDR3, DVI, HDMI, LVDS, Dual GbE, USB 3.0, SATA 6Gb/s, PCIe Mini, PCIe x16, Intel® AMT, RoHS

User Manual

Rev. 1.01 – 7 December, 2012

RoHS Lead Free

Revision

Date	Version	Changes
7 December, 2012	1.01	Modified PICe Mini card slot specification Modified Table 4-5: Display Mode Selection Jumper Settings
17 July, 2012	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Table of Contents

1 INTRODUCTION 1

1.1 INTRODUCTION 2
1.2 BENEFITS 3
1.3 FEATURES 3
1.4 CONNECTORS 4
1.5 DIMENSIONS 5
1.6 DATA FLOW 6
1.7 TECHNICAL SPECIFICATIONS 7

2 PACKING LIST 9

2.1 ANTI-STATIC PRECAUTIONS 10
2.2 UNPACKING PRECAUTIONS 10
2.3 PACKING LIST 11
2.4 OPTIONAL ITEMS 12

3 CONNECTOR PINOUTS 14

3.1 PERIPHERAL INTERFACE CONNECTORS 15
3.1.1 Layout 15
3.1.2 Peripheral Interface Connectors 16
3.1.3 External Interface Panel Connectors 17
3.2 INTERNAL PERIPHERAL CONNECTORS 17
3.2.1 Audio Connector 17
3.2.2 Battery Connector 18
3.2.3 Digital I/O Connector 19
3.2.4 EC Debug Port 20
3.2.5 Fan Connector (CPU) 21
3.2.6 Fan Connector (System) 22
3.2.7 Front Panel Connector 23
3.2.8 Infrared Interface Connector 24
3.2.9 Keyboard/Mouse Connector 25
3.2.10 LVDS Connector 26

3.2.11 LVDS Backlight Connector *28*
3.2.12 PCIe Mini Card Slot *28*
3.2.13 PCI Express x16 Slot *30*
3.2.14 Power Button (On-board) *33*
3.2.15 Power Connector (12V) *33*
3.2.16 RS-232 Serial Port Connectors (COM2) *34*
3.2.17 RS-422/485 Serial Port Connector (COM3) *35*
3.2.18 SATA 6Gb/s Drive Connectors *36*
3.2.19 SATA 3Gb/s Drive Connectors *37*
3.2.20 SATA Power Connectors *38*
3.2.21 SMBus Connector *39*
3.2.22 SO-DIMM Connectors *40*
3.2.23 SPDIF Connector *41*
3.2.24 SPI Flash Connector *42*
3.2.25 SPI Flash Connector (EC) *43*
3.2.26 TPM Connector *44*
3.2.27 USB 2.0 Connectors *45*
3.3 EXTERNAL INTERFACE CONNECTORS 46
3.3.1 Audio Connector *46*
3.3.2 DVI Connector *47*
3.3.3 Ethernet and USB 3.0 Connectors *48*
3.3.4 HDMI Connectors *49*
3.3.5 Power Connector (12 V, Power Adapter) *50*
3.3.6 Serial Port Connector (COM1) *51*

4 INSTALLATION 52

4.1 ANTI-STATIC PRECAUTIONS 53
4.2 INSTALLATION CONSIDERATIONS 53
4.3 CPU, CPU COOLING KIT AND SO-DIMM INSTALLATION 55
4.3.1 Socket G2 CPU Installation *55*
4.3.2 Socket G2 Cooling Kit Installation *57*
4.4 SO-DIMM INSTALLATION 60
4.5 PCIE MINI CARD INSTALLATION 61
4.6 JUMPER SETTINGS 62
4.6.1 AT/ATX Mode Selection *63*

4.6.2 Clear CMOS *63*
4.6.3 Clear ME RTC Registers *65*
4.6.4 Display Mode Selection *65*
4.6.5 Flash Descriptor Security Override *66*
4.6.6 LVDS Voltage Selection *67*
4.6.7 LVDS Resolution Selection *68*
4.6.8 PCIe Channel Mode Selection *69*
4.7 CHASSIS INSTALLATION 70
4.7.1 Airflow *70*
4.7.2 Motherboard Installation *70*
4.8 INTERNAL PERIPHERAL DEVICE CONNECTIONS 71
4.8.1 SATA Drive Connection *71*
4.8.2 Single RS-232 Cable (w/o Bracket) *72*
4.9 EXTERNAL PERIPHERAL INTERFACE CONNECTION 73
4.9.1 Audio Connector *73*
4.9.2 DVI Display Device Connection *74*
4.9.3 HDMI Display Device Connection *75*
4.9.4 LAN Connection (Single Connector) *75*
4.9.5 USB Connection (Dual Connector) *76*
4.10 INTEL® AMT SETUP PROCEDURE 77

5 BIOS 79

5.1 INTRODUCTION 80
5.1.1 Starting Setup *80*
5.1.2 Using Setup *80*
5.1.3 Getting Help *81*
5.1.4 Unable to Reboot After Configuration Changes *81*
5.1.5 BIOS Menu Bar *81*
5.2 MAIN 82
5.3 ADVANCED 83
5.3.1 ACPI Configuration *84*
5.3.2 RTC Wake Settings *85*
5.3.3 Trusted Computing *86*
5.3.4 CPU Configuration *87*
5.3.5 SATA Configuration *89*

5.3.6 Intel(R) Rapid Start Technology *90*
5.3.7 Intel TXT(LT) Configuration *90*
5.3.8 AMT Configuration *91*
5.3.9 USB Configuration *92*
5.3.10 F81866 Super IO Configuration *93*
5.3.10.1 Serial Port n Configuration 94
5.3.11 F81866 H/W Monitor *97*
5.3.11.1 Smart Fan Mode Configuration 98
5.3.12 Serial Port Console Redirection *99*
5.3.13 IEI Feature *100*
5.4 CHIPSET 101
5.4.1 PCH-IO Configuration *103*
5.4.2 System Agent (SA) Configuration *104*
5.4.2.1 Graphics Configuration 105
5.4.2.2 Memory Configuration 108
5.5 BOOT 108
5.6 SECURITY 111
5.7 EXIT 111

6 SOFTWARE DRIVERS 113

6.1 AVAILABLE SOFTWARE DRIVERS 114
6.2 SOFTWARE INSTALLATION 114
6.3 CHIPSET DRIVER INSTALLATION 116
6.4 GRAPHICS DRIVER INSTALLATION 119
6.5 LAN DRIVER INSTALLATION 122
6.6 AUDIO DRIVER INSTALLATION 125
6.7 INTEL® RAPID STORAGE TECHNOLOGY DRIVER INSTALLATION 128
6.8 USB 3.0 DRIVER INSTALLATION 131
6.9 INTEL® AMT DRIVER INSTALLATION 134

A BIOS OPTIONS 137

B ONE KEY RECOVERY 140

B.1 ONE KEY RECOVERY INTRODUCTION 141
B.1.1 System Requirement *142*
B.1.2 Supported Operating System *143*

B.2 SETUP PROCEDURE FOR WINDOWS 144
B.2.1 Hardware and BIOS Setup 145
B.2.2 Create Partitions 145
B.2.3 Install Operating System, Drivers and Applications 149
B.2.4 Building the Recovery Partition 150
B.2.5 Create Factory Default Image 152
B.3 AUTO RECOVERY SETUP PROCEDURE 157
B.4 SETUP PROCEDURE FOR LINUX 162
B.5 RECOVERY TOOL FUNCTIONS 165
B.5.1 Factory Restore 167
B.5.2 Backup System 168
B.5.3 Restore Your Last Backup 169
B.5.4 Manual 170
B.6 RESTORE SYSTEMS FROM A LINUX SERVER THROUGH LAN 171
B.6.1 Configure DHCP Server Settings 172
B.6.2 Configure TFTP Settings 173
B.6.3 Configure One Key Recovery Server Settings 174
B.6.4 Start the DHCP, TFTP and HTTP 175
B.6.5 Create Shared Directory 175
B.6.6 Setup a Client System for Auto Recovery 176
B.7 OTHER INFORMATION 179
B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller 179
B.7.2 System Memory Requirement 181

C TERMINOLOGY 182

D DIGITAL I/O INTERFACE 186

D.1 INTRODUCTION 187
D.2 DIO CONNECTOR PINOUTS 187
D.3 ASSEMBLY LANGUAGE SAMPLES 187
D.3.1 Enable the DIO Input Function 187
D.3.2 Enable the DIO Output Function 188

E HAZARDOUS MATERIALS DISCLOSURE 189

E.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY 190

List of Figures

Figure 1-1: KINO-QM770 2
Figure 1-2: Connectors 4
Figure 1-3: Dimensions (mm) 5
Figure 1-4: Data Flow Diagram 6
Figure 3-1: Connector and Jumper Locations 15
Figure 3-3: Audio Connector Location 18
Figure 3-4: Battery Connector Location 19
Figure 3-5: Digital I/O Connector Location 20
Figure 3-6: BIOS Debug Port Location 21
Figure 3-7: CPU Fan Connector Location 22
Figure 3-8: System Fan Connector Location 23
Figure 3-9: Front Panel Connector Location 24
Figure 3-10: Infrared Connector Location 25
Figure 3-11: Keyboard/Mouse Connector Location 26
Figure 3-12: LVDS Connector Location 27
Figure 3-13: LVDS Backlight Inverter Connector 28
Figure 3-14: PCIe Mini Card Slot Location 29
Figure 3-15: PCIe x16 Slot Location 31
Figure 3-16: On-board Power Button Location 33
Figure 3-17: Power Connector Location 34
Figure 3-18: RS-232 Serial Port Connector Location 35
Figure 3-19: RS-422/485 Serial Port Connector Location 36
Figure 3-20: SATA 6Gb/s Drive Connector Locations 37
Figure 3-21: SATA 3Gb/s Drive Connector Locations 38
Figure 3-22: SATA Power Connector Locations 39
Figure 3-23: SMBus Connector Location 40
Figure 3-24: SO-DIMM Connector Locations 41
Figure 3-25: SPDIF Connector Location 41
Figure 3-26: SPI Flash Connector Location 42
Figure 3-27: EC SPI Flash Connector Location 43

Figure 3-28: TPM Connector Location 44
Figure 3-29: USB Connector Locations 45
Figure 3-30: External Interface Connectors 46
Figure 3-31: Audio Jacks 47
Figure 3-32: DVI-I Connector 48
Figure 3-33: Ethernet Connector 48
Figure 3-34: HDMI Connector 50
Figure 3-35: 4-pin Power Mini-DIN Connection 50
Figure 3-36: Serial Port Pinouts 51
Figure 4-1: Unlock CPU socket retention screw 56
Figure 4-2: Lock the CPU Socket Retention Screw 57
Figure 4-3: Install Support Bracket 58
Figure 4-4: Align the Cooling Kit 59
Figure 4-5: Secure the Cooling Kit 60
Figure 4-6: SO-DIMM Installation 60
Figure 4-7: PCIe Mini Card Installation 61
Figure 4-8: AT/ATX Mode Selection Jumper Location 63
Figure 4-9: Clear CMOS Jumper Location 64
Figure 4-10: Clear ME RTC Registers Jumper Location 65
Figure 4-11: Display Mode Selection Jumper Location 66
Figure 4-12: Flash Descriptor Security Override Jumper Location 67
Figure 4-13: LVDS Voltage Selection Jumper Location 68
Figure 4-14: LVDS Resolution Selection Jumper Location 69
Figure 4-15: PCIe Channel Mode Selection Jumper Location 70
Figure 4-16: SATA Drive Cable Connection 71
Figure 4-17: Single RS-232 Cable Installation 72
Figure 4-18: Audio Connector 73
Figure 4-19: DVI Connector 74
Figure 4-20: HDMI Connection 75
Figure 4-21: LAN Connection 76
Figure 4-22: USB Connector 77
Figure 6-1: Introduction Screen 115
Figure 6-2: Available Drivers 115
Figure 6-3: Chipset Driver Welcome Screen 116
Figure 6-4: Chipset Driver License Agreement 117

Figure 6-5: Chipset Driver Read Me File 117
Figure 6-6: Chipset Driver Setup Operations 118
Figure 6-7: Chipset Driver Installation Finish Screen 119
Figure 6-8: Graphics Driver Welcome Screen 120
Figure 6-9: Graphics Driver License Agreement 120
Figure 6-10: Graphics Driver Setup Operations 121
Figure 6-11: Graphics Driver Installation Finish Screen 121
Figure 6-12: Windows Control Panel 122
Figure 6-13: System Control Panel 122
Figure 6-14: Device Manager List 123
Figure 6-15: Update Driver Software Window 124
Figure 6-16: Locate Driver Files 124
Figure 6-17: LAN Driver Installation 125
Figure 6-18: LAN Driver Installation Complete 125
Figure 6-19: InstallShield Wizard Welcome Screen 126
Figure 6-20: Audio Driver Software Configuration 127
Figure 6-21: Restart the Computer 127
Figure 6-22: SATA RAID Driver Welcome Screen 128
Figure 6-23: SATA RAID Driver License Agreement 129
Figure 6-24: SATA RAID Driver Read Me File 129
Figure 6-25: SATA RAID Driver Setup Operations 130
Figure 6-26: SATA RAID Driver Installation Finish Screen 130
Figure 6-27: USB 3.0 Driver Welcome Screen 131
Figure 6-28: USB 3.0 Driver License Agreement 132
Figure 6-29: USB 3.0 Driver Read Me File 132
Figure 6-30: USB 3.0 Driver Setup Operations 133
Figure 6-31: USB 3.0 Driver Installation Finish Screen 133
Figure 6-32: Intel® ME Driver Welcome Screen 135
Figure 6-33: Intel® ME Driver License Agreement 135
Figure 6-34: Intel® ME Driver Setup Operations 136
Figure 6-35: Intel® ME Driver Installation Finish Screen 136
Figure B-1: IEI One Key Recovery Tool Menu 141
Figure B-2: Launching the Recovery Tool 146
Figure B-3: Recovery Tool Setup Menu 146
Figure B-4: Command Prompt 147

Figure B-5: Partition Creation Commands 148
Figure B-6: Launching the Recovery Tool 150
Figure B-7: Manual Recovery Environment for Windows 150
Figure B-8: Building the Recovery Partition 151
Figure B-9: Press Any Key to Continue 151
Figure B-10: Press F3 to Boot into Recovery Mode 152
Figure B-11: Recovery Tool Menu 152
Figure B-12: About Symantec Ghost Window 153
Figure B-13: Symantec Ghost Path 153
Figure B-14: Select a Local Source Drive 154
Figure B-15: Select a Source Partition from Basic Drive 154
Figure B-16: File Name to Copy Image to 155
Figure B-17: Compress Image 155
Figure B-18: Image Creation Confirmation 156
Figure B-19: Image Creation Complete 156
Figure B-20: Image Creation Complete 156
Figure B-21: Press Any Key to Continue 157
Figure B-22: Auto Recovery Utility 158
Figure B-23: Disable Automatically Restart 158
Figure B-24: Launching the Recovery Tool 159
Figure B-25: Auto Recovery Environment for Windows 159
Figure B-26: Building the Auto Recovery Partition 160
Figure B-27: Factory Default Image Confirmation 160
Figure B-28: Image Creation Complete 161
Figure B-29: Press any key to continue 161
Figure B-30: IEI Feature 162
Figure B-31: Partitions for Linux 163
Figure B-32: Manual Recovery Environment for Linux 164
Figure B-33: Access menu.lst in Linux (Text Mode) 164
Figure B-34: Recovery Tool Menu 165
Figure B-35: Recovery Tool Main Menu 166
Figure B-36: Restore Factory Default 167
Figure B-37: Recovery Complete Window 167
Figure B-38: Backup System 168
Figure B-39: System Backup Complete Window 168

Figure B-40: Restore Backup 169
Figure B-41: Restore System Backup Complete Window 169
Figure B-42: Symantec Ghost Window 170
Figure B-43: Disable Automatically Restart 177

List of Tables

Table 1-1: Technical Specifications 8
Table 2-1: Packing List 12
Table 2-2: Optional Items 13
Table 3-1: Peripheral Interface Connectors 17
Table 3-2: Rear Panel Connectors 17
Table 3-3: Audio Connector Pinouts 18
Table 3-4: Battery Connector Pinouts 19
Table 3-5: Digital I/O Connector Pinouts 20
Table 3-6: EC Debug Port Pinouts 21
Table 3-7: CPU Fan Connector Pinouts 22
Table 3-8: System Fan Connector Pinouts 23
Table 3-9: Front Panel Connector Pinouts 24
Table 3-10: Infrared Connector Pinouts 25
Table 3-11: Keyboard/Mouse Connector Pinouts 26
Table 3-12: LVDS Connector Pinouts 27
Table 3-13: Backlight Inverter Connector Pinouts 28
Table 3-14: PCIe Mini Card Slot Pinouts 30
Table 3-15: PCIe x16 Side A Pinouts 32
Table 3-16: PCIe x16 Side B Pinouts 32
Table 3-17: Power Connector Pinouts 34
Table 3-18: Serial Port Connector Pinouts 35
Table 3-19: RS-422/485 Serial Port Connector Pinouts 36
Table 3-20: DB-9 RS-422/485 Pinouts 36
Table 3-21: SATA 6Gb/s Drive Connector Pinouts 37
Table 3-22: SATA 3Gb/s Drive Connector Pinouts 38
Table 3-23: SATA Power Connector Pinouts 39
Table 3-24: SMBus Connector Pinouts 40
Table 3-25: SPDIF Connector Pinouts 42
Table 3-26: SPI Flash Connector Pinouts 43
Table 3-27: EC SPI Flash Connector Pinouts 43

Table 3-28: TPM Connector Pinouts 44
Table 3-29: USB Port Connector Pinouts 45
Table 3-30: DVI Connector Pinouts 48
Table 3-31: LAN Pinouts 48
Table 3-32: Connector LEDs 49
Table 3-33: USB Port Pinouts 49
Table 3-34: HDMI Connector Pinouts 50
Table 3-35: Serial Port Pinouts 51
Table 4-1: Jumpers 62
Table 4-2: AT/ATX Mode Selection Jumper Settings 63
Table 4-3: Clear CMOS Jumper Settings 64
Table 4-4: Clear ME RTC Registers Jumper Settings 65
Table 4-5: Display Mode Selection Jumper Settings 66
Table 4-6: Flash Descriptor Security Override Jumper Settings 67
Table 4-7: LVDS Voltage Selection Jumper Settings 67
Table 4-8: LVDS Resolution Selection Jumper Settings 69
Table 4-9: PCIe Channel Mode Selection Jumper Settings 69
Table 5-1: BIOS Navigation Keys 81
Table 6-1: Digital I/O Connector Pinouts 187

BIOS Menus

BIOS Menu 1: Main 82
BIOS Menu 2: Advanced 83
BIOS Menu 3: ACPI Configuration 84
BIOS Menu 4: RTC Wake Settings 85
BIOS Menu 5: Trusted Computing 86
BIOS Menu 6: CPU Configuration 87
BIOS Menu 7: SATA Configuration 89
BIOS Menu 8: Intel(R) Rapid Start Technology 90
BIOS Menu 9: Intel TXT(LT) Configuration 91
BIOS Menu 10: AMT Configuration 91
BIOS Menu 11: USB Configuration 92
BIOS Menu 12: F81866 Super IO Configuration 93
BIOS Menu 13: Serial Port n Configuration 94
BIOS Menu 14: F81866 H/W Monitor 97
BIOS Menu 15: Smar Fan Mode Configuration 98
BIOS Menu 16: Serial Port Console Redirection 100
BIOS Menu 17: IEI Feature 101
BIOS Menu 18: Chipset 102
BIOS Menu 19:PCH-IO Configuration 103
BIOS Menu 20: System Agent (SA) Configuration 104
BIOS Menu 21: Graphics Configuration 105
BIOS Menu 22: Memory Configuration 108
BIOS Menu 23: Boot 108
BIOS Menu 24: Security 111
BIOS Menu 25:Exit 112

Chapter

1

Introduction

1.1 Introduction

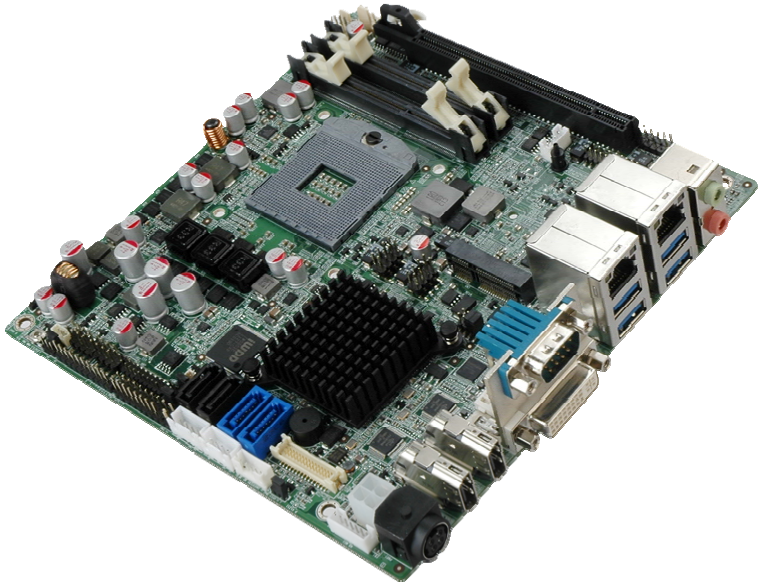


Figure 1-1: KINO-QM770

The KINO-QM770 is a Mini-ITX SBC with a 3rd generation 22nm Intel® mobile CPU and Intel® QM77 Express Chipset. Storage on the board is handled by two SATA 6Gb/s ports and two SATA 3Gb/s ports for connecting a hard drive, optical drive or SSD.

The board has three types of graphics outputs. A DVI-I output connects to a DVI monitor or a traditional VGA monitor. One LVDS connector supports 24-bit dual-channel display and two HDMI connectors support HDMI 1080p display.

Other slots and connectors include RS-232, RS-422/485, Gigabit Ethernet, USB 3.0 ports, USB 2.0 ports and digital I/O.

1.2 Benefits

Some of the KINO-QM770 motherboard benefits include:

- Low power consumption
- Wide range of I/O interfaces
- Triple independent display support

1.3 Features

Some of the KINO-QM770 motherboard features are listed below:

- Mini-ITX form factor
- RoHS compliant
- Intel® AMT 8.0 support
- Dual GbE
- Supports HDMI, LVDS and DVI-I interface for triple independent display (HDMI V1.3a compliant)
- Eight USB ports (four USB 2.0, four USB 3.0)
- Three serial ports
- PCIe Mini card slot
- PCIe x16 slot

1.4 Connectors

The connectors on the KINO-QM770 are shown in the figure below.

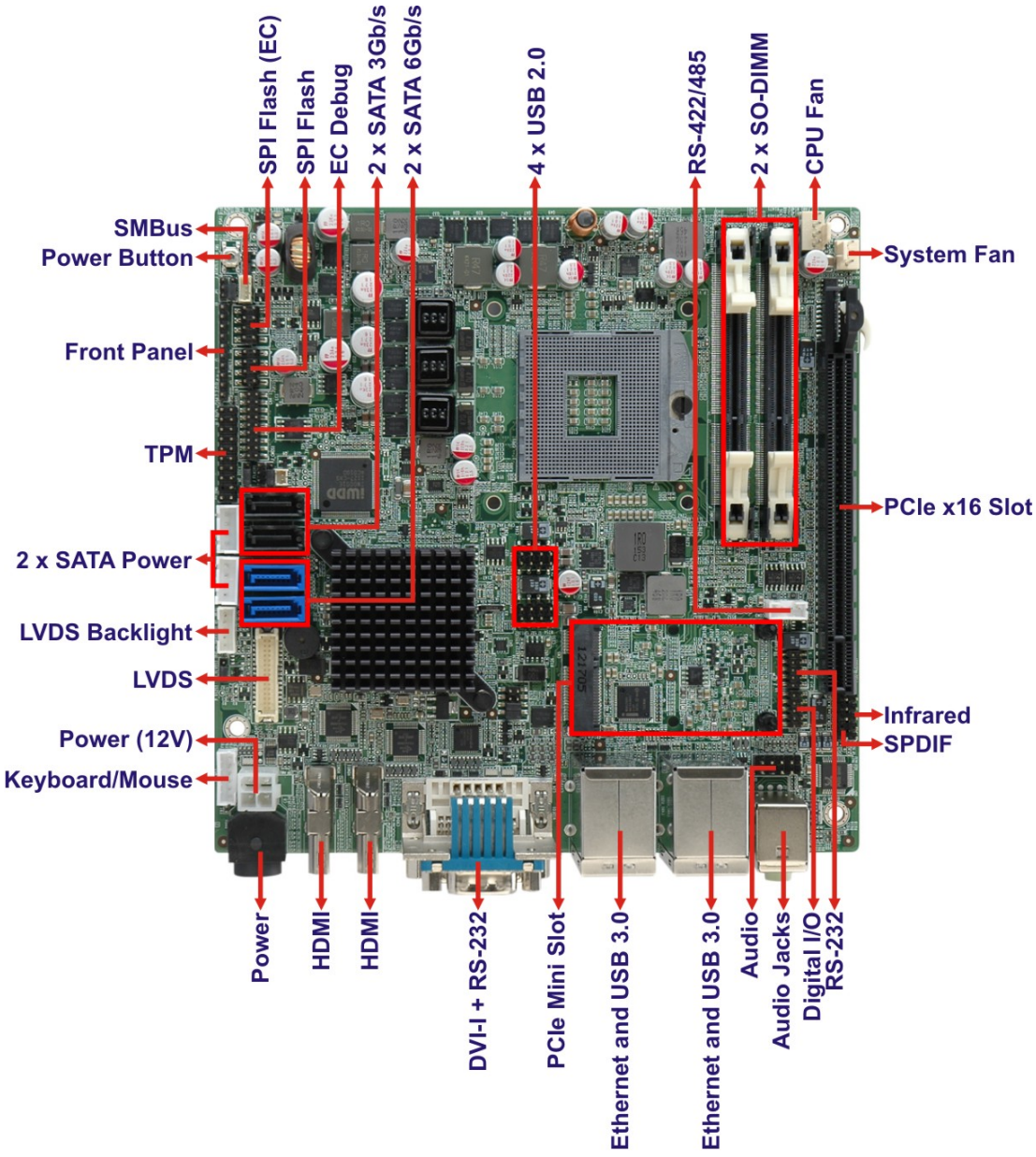


Figure 1-2: Connectors

1.5 Dimensions

The main dimensions of the KINO-QM770 are shown in the diagram below.

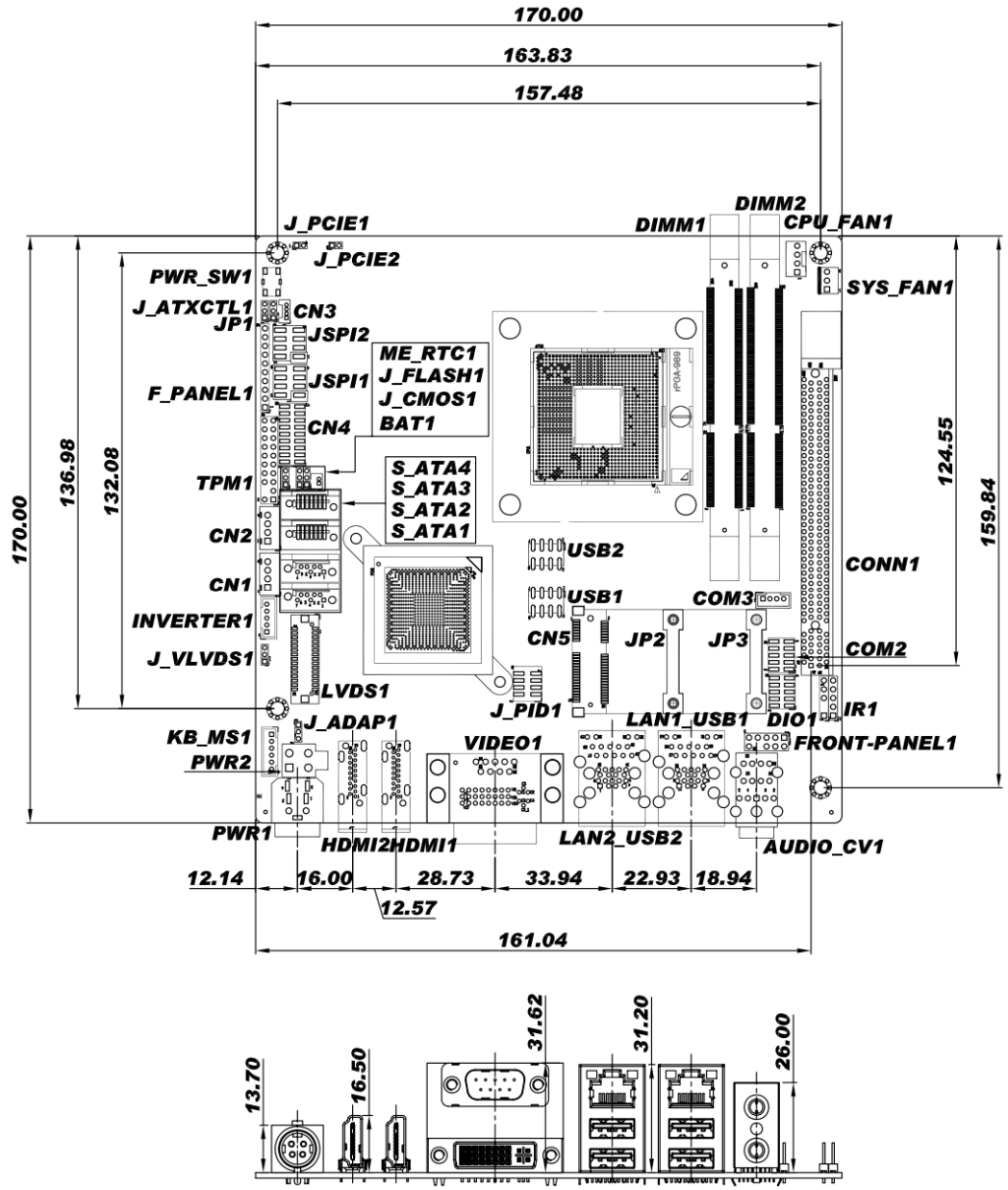


Figure 1-3: Dimensions (mm)

1.6 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

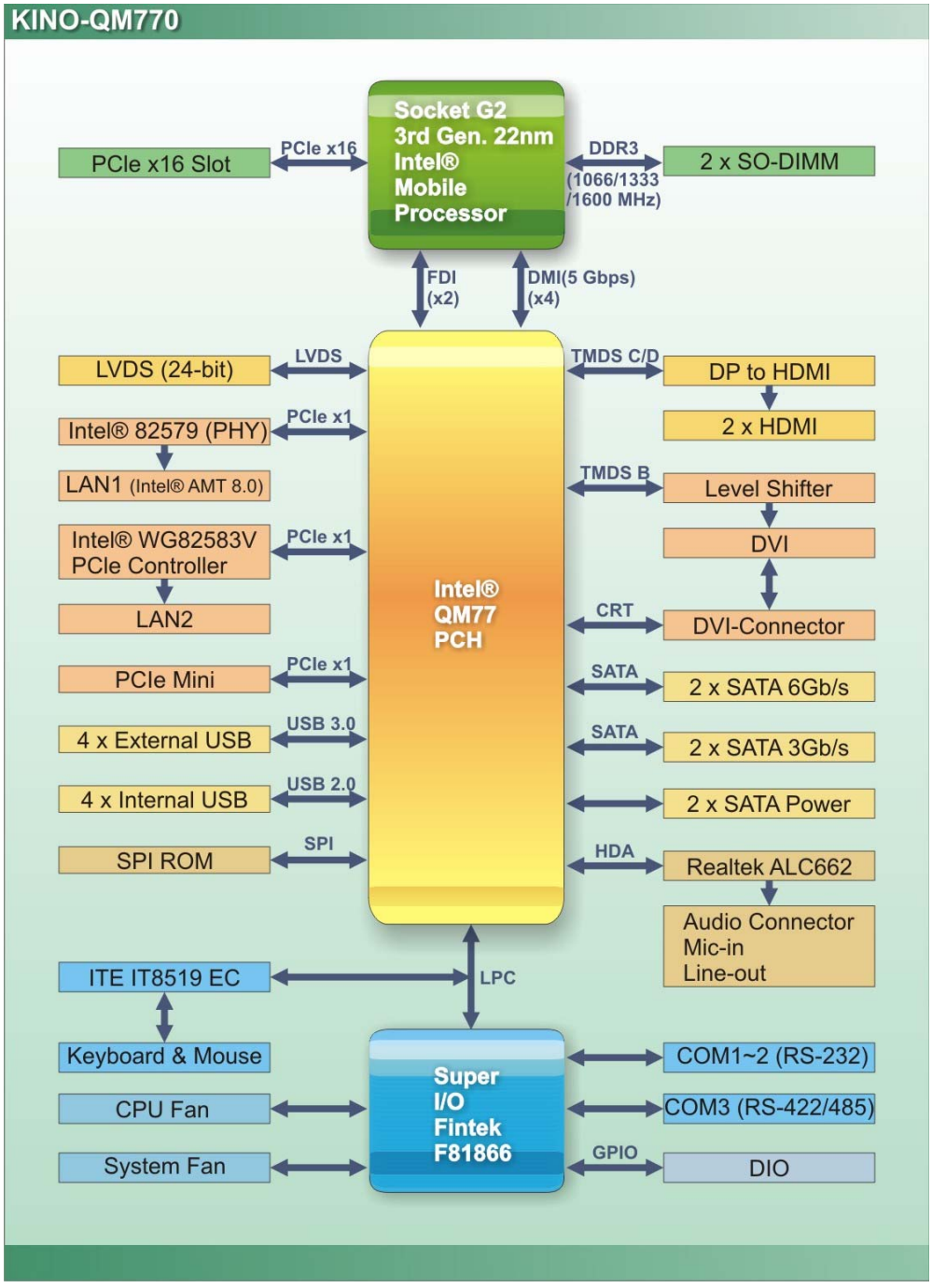


Figure 1-4: Data Flow Diagram

1.7 Technical Specifications

KINO-QM770 technical specifications are listed in Table 1-1.

Specification	KINO-QM770
Form Factor	Mini-ITX
CPU Socket	Socket G2
CPU	3rd generation 22nm Intel® mobile CPU
System Chipset	Intel® QM77
Memory	Two 204-pin 1600/1333/1066 MHz DDR3 SO-DIMM supported (system max. 16.0GB)
Graphics Engine	Intel® Gen 7 with DirectX 11, OGL 3.1, OCL 1.1
BIOS	UEFI BIOS
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	**LAN1:** Intel® 82579 PHY (through PCIe x1) with Intel® AMT 8.0 support **LAN2:** Intel® 82583V PCIe Ethernet controller (through PCIe x1)
Audio	Realtek ALC662 HD Audio codec
Super I/O Controller	Fintek F81866
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	1 x Full-size PCIe Mini slot 1 x PCIe x16 slot
I/O Interface Connectors	
Display Output Ports (Triple Display Supported)	1 x DVI-I with analog CRT and DVI support 2 x HDMI (1080p) 1 x 18/24-bit dual-channel LVDS
Fan connector	One 4-pin wafer for CPU fan One 3-pin wafer for system fan
Keyboard/Mouse	One internal 6-pin wafer connector

Serial Ports	Two RS-232 COM connectors (one by pin header, one on rear side) One RS-422/485 COM connector (4-pin wafer)
USB Ports	Four internal USB 2.0 ports (by two 8-pin header) Four external USB 3.0 ports
SMBus	One 4-pin wafer connector
Storage	
SATA	2 x SATA 3Gb/s 2 x SATA 6Gb/s with RAID 0/1/5/10 support
Environmental and Power Specifications	
Power Supply	12V only, AT/ATX support
Power Connector	1 x External 4-pin DIN DC jack 1 x Internal 4-pin (2x2) power connector
Power Consumption	12V@6.08A (2.30GHz Intel® Core™ i7-3610QE CPU with two 4GB 1333MHz DDR3 memory running 3DMark06 burn-in)
Operating Temperature	-10ºC ~ 60ºC (32ºF ~ 140ºF)
Storage Temperature	-20ºC ~ 70ºC
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	900 g/450 g

Table 1-1: Technical Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: - Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***:- Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***:- Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the KINO-QM770 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the KINO-QM770 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The KINO-QM770 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-QM770 SBC	
2	SATA and power cable (**P/N:** 32801-000100-100-RS)	
2	RS-232 cable (**P/N:** 19800-000300-100-RS)	
1	I/O shielding (**P/N:** 45014-0037C0-00-RS)	
1	Mini jumper pack (2.0mm) (**P/N**:33100-000033-RS)	
1	Utility CD	

Quantity	Item and Part Number	Image
1	One Key Recovery CD	
1	Quick installation guide	

Table 2-1: Packing List

2.4 Optional Items

These optional items are available.

Item and Part Number	Image
RS-422/485 cable (**P/N**: 32205-003800-100-RS)	
Dual USB cable (w bracket) (**P/N:** 19800-003100-100-RS)	
KB/MS PS/2 Y-cable (**P/N**: 32000-023800-RS)	
CPU cooler (**P/N**: CF-989A-RS-R12)	

Item and Part Number	Image
Infineon TPM module (**P/N**: TPM-IN01-R11)	
DVI-VGA Adaptor (**P/N**: 33Z00-000031-RS)	
SATA to IDE/CF converter board (**P/N**: SACF-KIT01-R10)	

Table 2-2: Optional Items

Chapter

3

Connector Pinouts

3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.1**.

3.1.1 Layout

The figure below shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

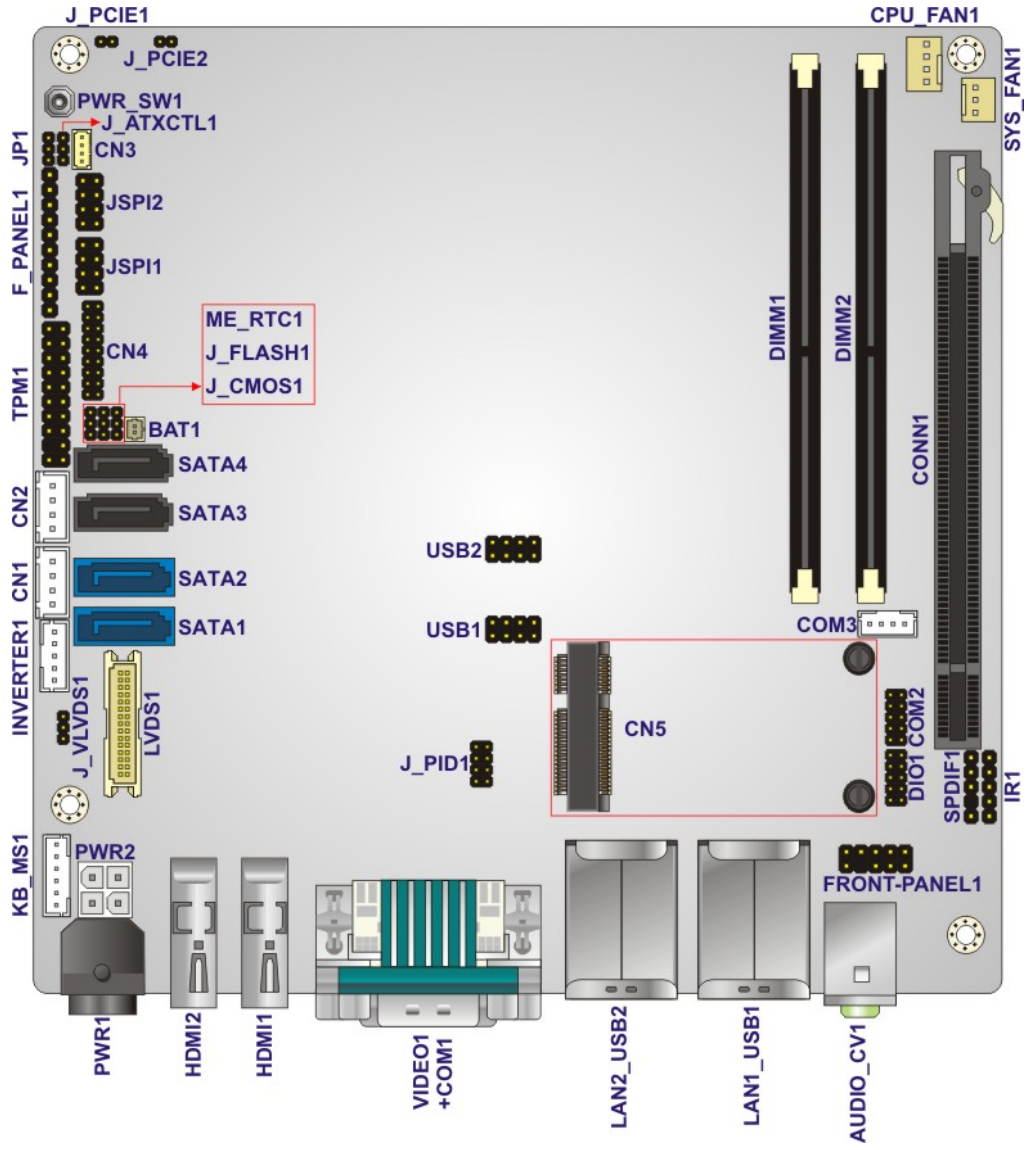


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the KINO-QM770. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Audio connector	10-pin header	FRONT-PANEL1
Battery connector	2-pin wafer	BAT1
Digital I/O connector	10-pin header	DIO1
EC debug port	18-pin header	CN4
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	SYS_FAN1
Front panel connector	10-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
Keyboard/mouse connector	6-pin wafer	KB_MS1
LVDS connector	30-pin crimp	LVDS1
LVDS backlight connector	5-pin wafer	INVERTER1
PCIe Mini card slot	PCIe Mini card slot	CN5
PCIe x16 slot	PCIe x16 slot	CONN1
Power button (on-board)	Push button	PWR_SW1
Power connector (12V)	4-pin connector	PWR2
RS-232 serial ports (COM2)	10-pin header	COM2
RS-422/485 serial port (COM3)	4-pin wafer	COM3
SATA 6Gb/s connectors	SATA connector	S_ATA1, S_ATA2
SATA 3Gb/s connectors	SATA connector	S_ATA3, S_ATA4
SATA power connectors	2-pin wafer	CN1, CN2
SMBus connector	4-pin wafer	CN3
SO-DIMM connectors	SO-DIMM connector	DIMM1, DIMM2
SPDIF connector	5-pin header	SPDIF1

Connector	Type	Label
SPI Flash connector	8-pin header	JSPI1
SPI Flash connector (EC)	8-pin header	JSPI2
TPM connector	20-pin header	TPM1
USB 2.0 connectors	8-pin header	USB1, USB2

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the KINO-QM770. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
Audio jacks (mic-in, line-out)	Audio jack	AUDIO_CV1
DVI-I connector	DVI-I	VIDEO1
Ethernet and USB 3.0 connectors	RJ-45	LAN1_USB1, LAN2_USB2
HDMI connectors	HDMI	HDMI1, HDMI2
Power connector	4-pin DIN	PWR1
RS-232 serial port	DB-9	COM1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-QM770.

3.2.1 Audio Connector

CN Label: **FRONT-PANEL1**

CN Type: 10-pin header

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

This connector connects to speaker, microphone and audio input connectors on the front panel.

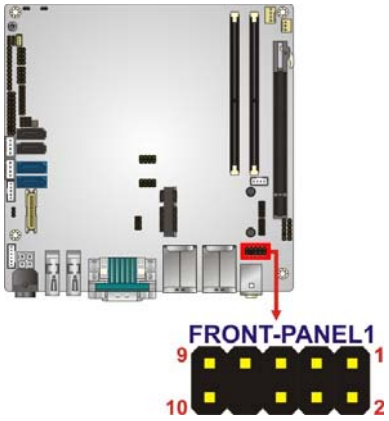


Figure 3-2: Audio Connector Location

Pin	Description	Pin	Description
1	LMIC2-L	2	ANALOG GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LLINE2-L	10	LINE2-JD

Table 3-3: Audio Connector Pinouts

3.2.2 Battery Connector

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label: **BAT1**

CN Type: 2-pin wafer

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

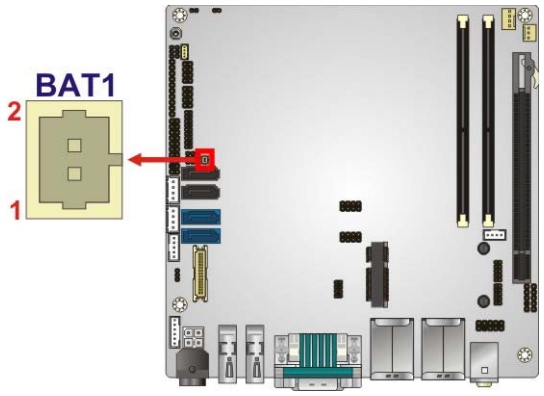


Figure 3-3: Battery Connector Location

Pin	Description
1	Battery+
2	Ground

Table 3-4: Battery Connector Pinouts

3.2.3 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.

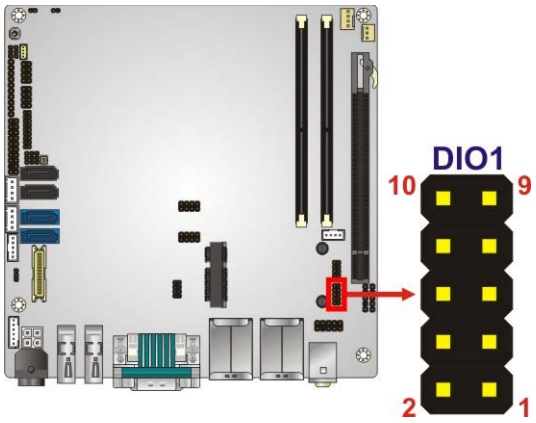


Figure 3-4: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	+V5S
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-5: Digital I/O Connector Pinouts

3.2.4 EC Debug Port

CN Label: **CN4**

CN Type: 18-pin header

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The connector is for EC debug only.

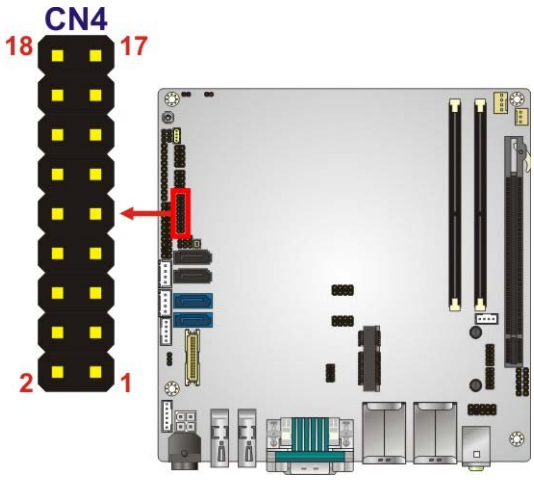


Figure 3-5: BIOS Debug Port Location

Pin	Description	Pin	Description
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

Table 3-6: EC Debug Port Pinouts

3.2.5 Fan Connector (CPU)

CN Label: **CPU_FAN1**

CN Type: 4-pin wafer

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The fan connector attaches to a CPU cooling fan.

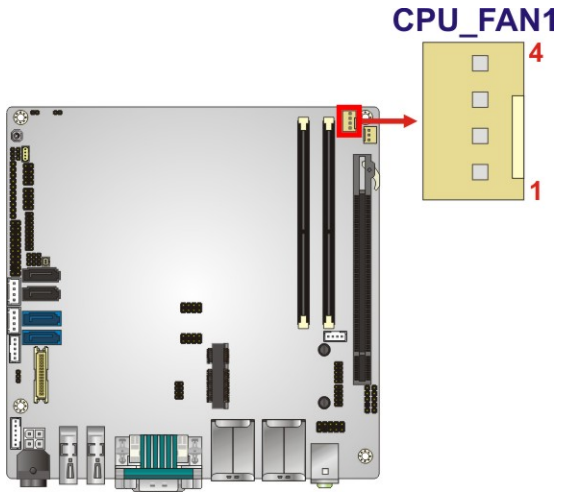


Figure 3-6: CPU Fan Connector Location

Pin	Description
1	GND
2	+V12S
3	Rotation Signal
4	PWM Control Signal

Table 3-7: CPU Fan Connector Pinouts

3.2.6 Fan Connector (System)

CN Label: **SYS_FAN1**

CN Type: 3-pin wafer

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

The fan connector attaches to a system cooling fan.

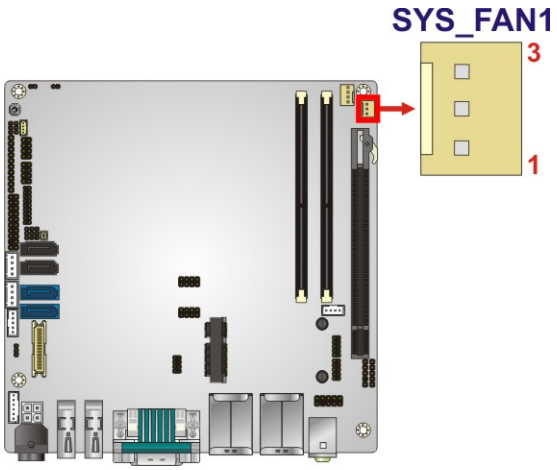


Figure 3-7: System Fan Connector Location

Pin	Description
1	Rotation Signal
2	+12V
3	GND

Table 3-8: System Fan Connector Pinouts

3.2.7 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 10-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

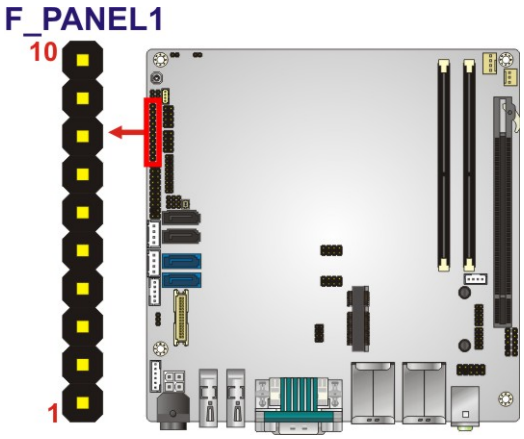


Figure 3-8: Front Panel Connector Location

	Pin	Description		Pin	Description
	1	NC	Power LED	6	PWR_LED+
Power Button	2	PWR_BTN+		7	PWR_LED+
	3	PWR_BTN-		8	GROUND
HDD LED	4	HDD_LED+	Reset	9	RESET+
	5	HDD_LED-		10	GROUND

Table 3-9: Front Panel Connector Pinouts

3.2.8 Infrared Interface Connector

CN Label: **IR1**

CN Type: 5-pin header

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

The infrared connector attaches to an infrared receiver for use with remote controls.

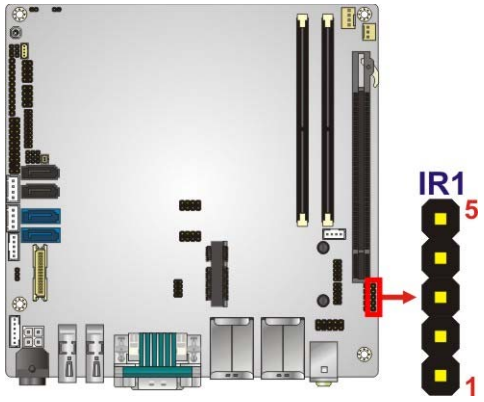


Figure 3-9: Infrared Connector Location

Pin	Description
1	VCC (+5V)
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-10: Infrared Connector Pinouts

3.2.9 Keyboard/Mouse Connector

CN Label: **KB_MS1**

CN Type: 6-pin wafer

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

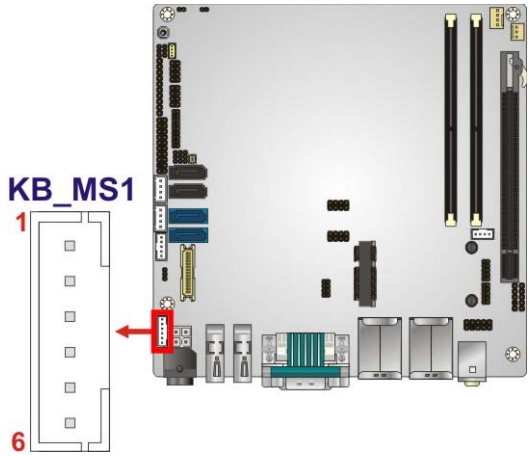


Figure 3-10: Keyboard/Mouse Connector Location

Pin	Description
1	VCC5_KBMS
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GND

Table 3-11: Keyboard/Mouse Connector Pinouts

3.2.10 LVDS Connector

CN Label: **LVDS1**

CN Type: 30-pin crimp

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

The LVDS connector is for an LCD panel connected to the board.

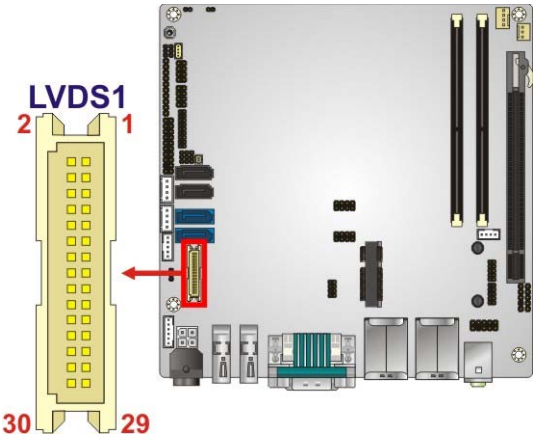


Figure 3-11: LVDS Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND	14	GND
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND	26	GND
27	VCC/VCC3	28	VCC/VCC3
29	VCC/VCC3	30	VCC/VCC3

Table 3-12: LVDS Connector Pinouts

3.2.11 LVDS Backlight Connector

CN Label: **INVERTER1**

CN Type: 5-pin wafer

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13**

The backlight inverter connectors provide power to LCD panels.

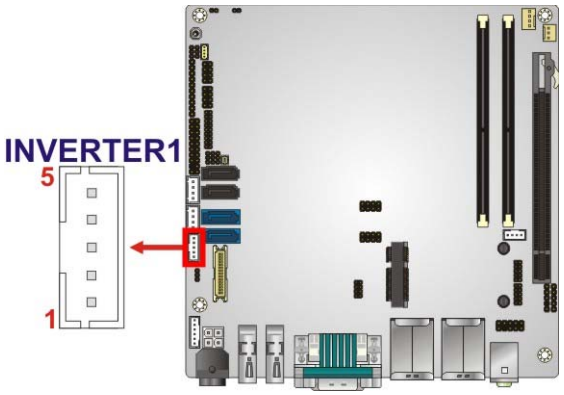


Figure 3-12: LVDS Backlight Inverter Connector

Pin	Description
1	BRIGHTNESS
2	GROUND
3	+12VS_LCD_BKL
4	GROUND
5	BACKLIGHT ENABLE

Table 3-13: Backlight Inverter Connector Pinouts

3.2.12 PCIe Mini Card Slot

CN Label: **CN5**

CN Type: PCIe Mini card slot

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

The PCIe Mini card slot enables a PCIe Mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards and IEI PCIe Mini disk on module (DOM) SSD cards.

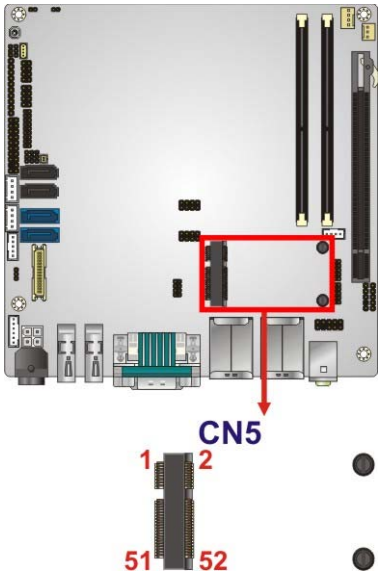


Figure 3-13: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND

Pin	Description	Pin	Description
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-14: PCIe Mini Card Slot Pinouts

3.2.13 PCI Express x16 Slot

CN Label: **CONN1**

CN Type: PCIe x16 slot

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15** (Side A) **Table 3-16** (Side B)

The PCIe x16 expansion cards slot is for PCIe x16 expansion cards.

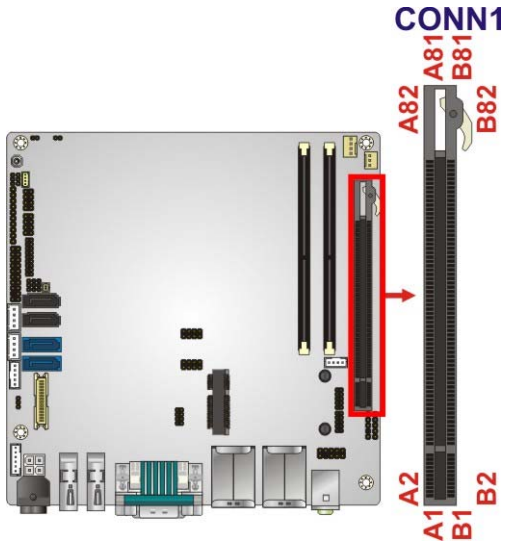


Figure 3-14: PCIe x16 Slot Location

Pin	Description	Pin	Description	Pin	Description	Pin	Description
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)

Pin	Description	Pin	Description	Pin	Description	Pin	Description
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		
A21	GND	A42	GND	A63	GND		

Table 3-15: PCIe x16 Side A Pinouts

Pin	Description	Pin	Description	Pin	Description	Pin	Description
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3 Vaux	B31	PRSNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 3-16: PCIe x16 Side B Pinouts

3.2.14 Power Button (On-board)

CN Label:	**PWR_SW1**
CN Type:	Push button
CN Location:	See **Figure 3-15**

Push the on-board power button to power on the KINO-QM770.

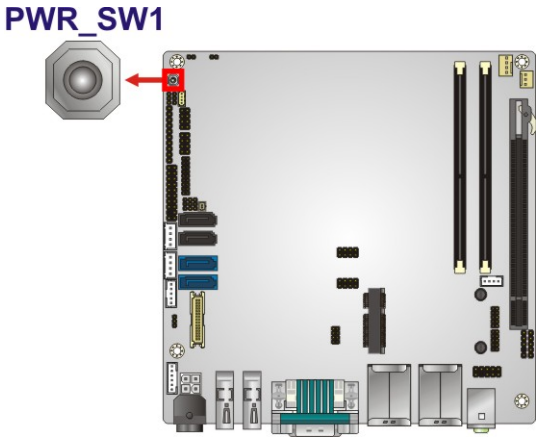


Figure 3-15: On-board Power Button Location

3.2.15 Power Connector (12V)

CN Label:	**PWR2**
CN Type:	4-pin connector
CN Location:	See **Figure 3-16**
CN Pinouts:	See **Table 3-17**

The power connector is connected to an external power supply and supports 12V power input. Power is provided to the system, from the power supply through this connector.

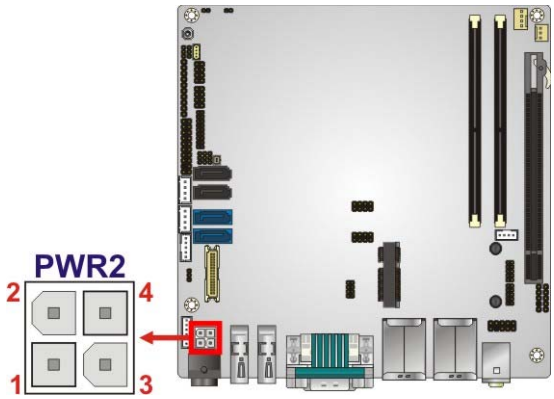


Figure 3-16: Power Connector Location

Pin	Description	Pin	Description
1	Ground	2	Ground
3	+12V	4	+12V

Table 3-17: Power Connector Pinouts

3.2.16 RS-232 Serial Port Connectors (COM2)

CN Label: **COM2**

CN Type: 10-pin header

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-18**

The 10-pin serial port connector provides one RS-232 serial communications channel. The COM serial port connector can be connected to an external RS-232 serial port device.

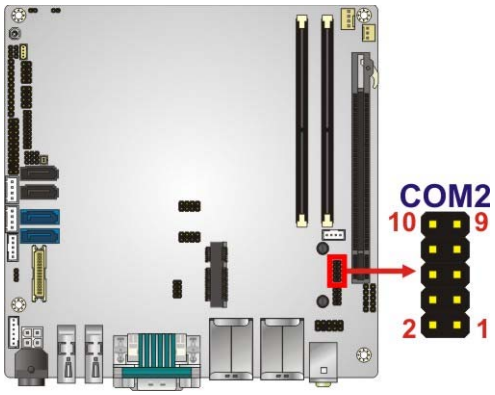


Figure 3-17: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	-NDCD2	6	-NCTS2
2	-NDSR2	7	-NDTR2
3	NSIN2	8	-XRI2
4	-NRTS2	9	GND
5	NSOUT2	10	GND

Table 3-18: Serial Port Connector Pinouts

3.2.17 RS-422/485 Serial Port Connector (COM3)

CN Label: **COM3**

CN Type: 4-pin wafer

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-19**

This connector provides RS-422 or RS-485 communications.

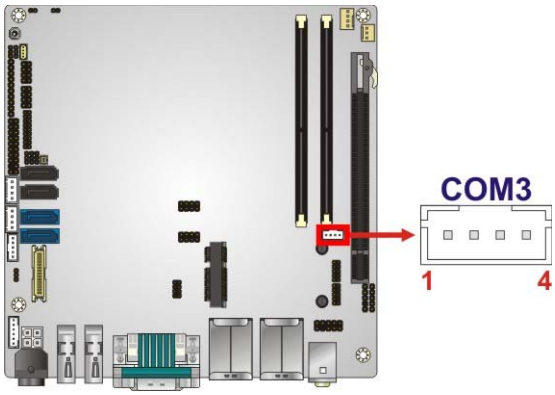


Figure 3-18: RS-422/485 Serial Port Connector Location

Pin	Description
1	RXD422-
2	RXD422+
3	TXD422+/TXD485+
4	TXD422-/TXD485-

Table 3-19: RS-422/485 Serial Port Connector Pinouts

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

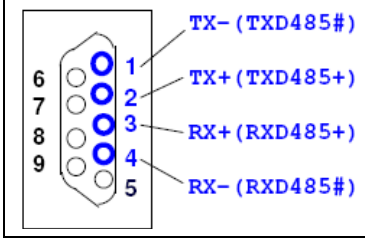
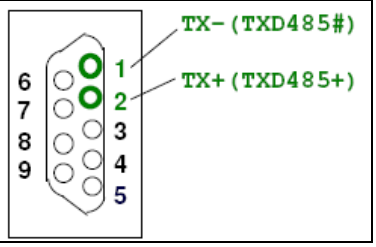
RS-422 Pinouts	RS-485 Pinouts
	

Table 3-20: DB-9 RS-422/485 Pinouts

3.2.18 SATA 6Gb/s Drive Connectors

CN Label: **S_ATA1, S_ATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-21**

The SATA connectors connect to SATA hard drives or optical drives with data transfer speeds as high as 6Gb/s.

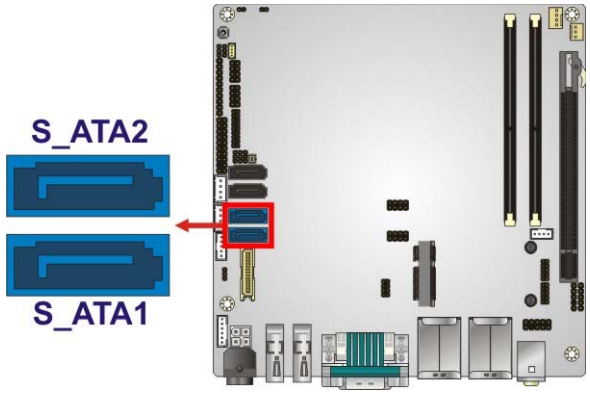


Figure 3-19: SATA 6Gb/s Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-21: SATA 6Gb/s Drive Connector Pinouts

3.2.19 SATA 3Gb/s Drive Connectors

CN Label: **S_ATA3, S_ATA4**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-22**

The SATA connectors connect to SATA hard drives or optical drives with data transfer speeds as high as 3Gb/s.

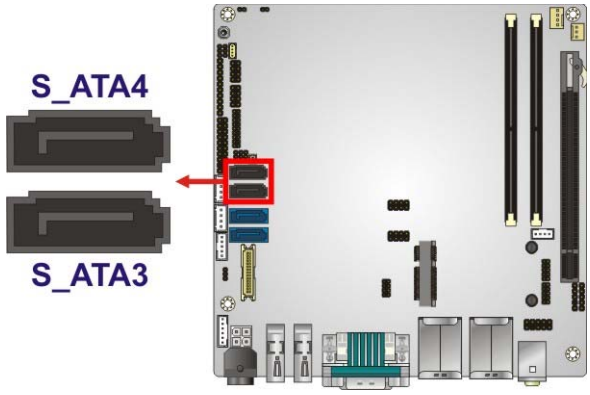


Figure 3-20: SATA 3Gb/s Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-22: SATA 3Gb/s Drive Connector Pinouts

3.2.20 SATA Power Connectors

CN Label: **CN1, CN2**

CN Type: 4-pin wafer

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-23**

Use the SATA Power Connector to connect to SATA device power connections.

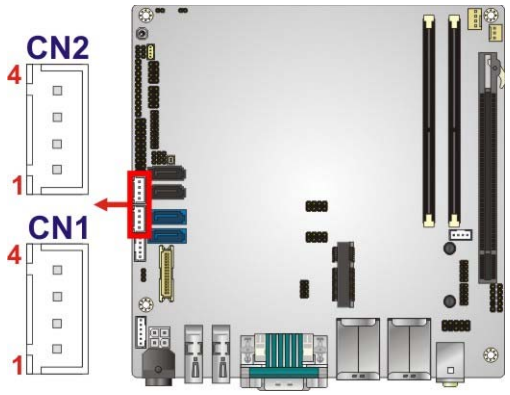


Figure 3-21: SATA Power Connector Locations

Pin	Description
1	+V12S
2	GND
3	GND
4	+V5S

Table 3-23: SATA Power Connector Pinouts

3.2.21 SMBus Connector

CN Label: **CN3**

CN Type: 4-pin wafer

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-24**

The SMBus (System Management Bus) connector provides low-speed system management communications.

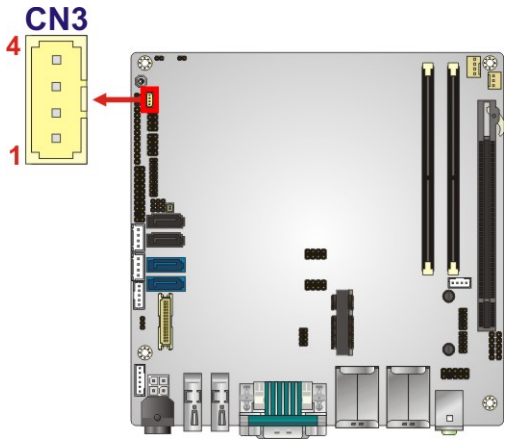


Figure 3-22: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

Table 3-24: SMBus Connector Pinouts

3.2.22 SO-DIMM Connectors

CN Label: **DIMM1, DIMM2**

CN Type: 204-pin DDR3 SO-DIMM connector

CN Location: See **Figure 3-23**

The SO-DIMM connector is for installing memory on the system.

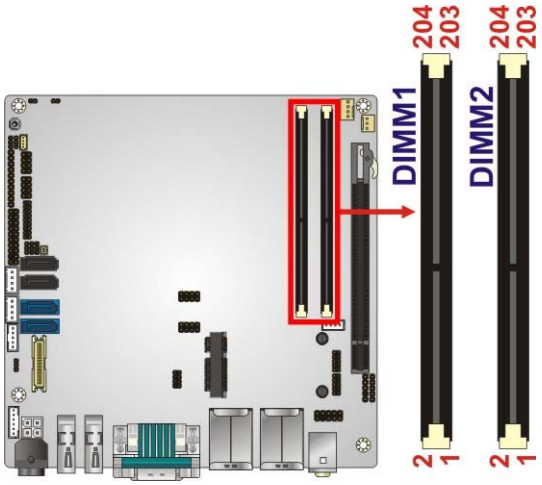


Figure 3-23: SO-DIMM Connector Locations

3.2.23 SPDIF Connector

CN Label:	**SPDIF1**
CN Type:	5-pin header
CN Location:	See **Figure 3-24**
CN Pinouts:	See **Table 3-25**

Use the SPDIF connector to connect digital audio devices to the system.

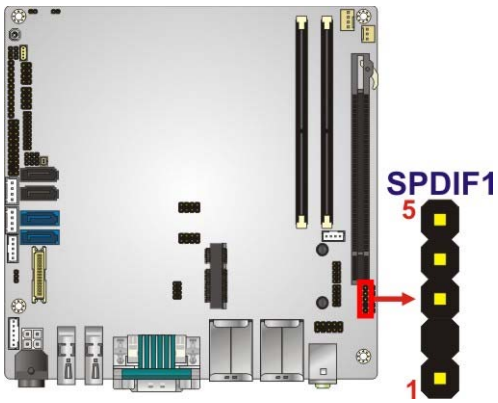


Figure 3-24: SPDIF Connector Location

PIN	DESCRIPTION
1	+V5S
2	NC

PIN	DESCRIPTION
3	SPDIFOUT
4	GND
5	SPDIFIN

Table 3-25: SPDIF Connector Pinouts

3.2.24 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin header

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-26**

The 8-pin SPI Flash connector is used to flash the BIOS.

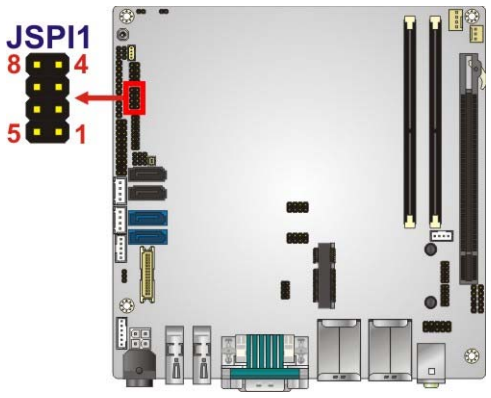


Figure 3-25: SPI Flash Connector Location

Pin	Description
1	+V3.3M_SPI_CON
2	SPI_CS
3	SPI_SO_SW
4	NC
5	GND
6	SPI_CLK_SW
7	SPI_SI_SW

Pin	Description
8	NC

Table 3-26: SPI Flash Connector Pinouts

3.2.25 SPI Flash Connector (EC)

CN Label: **JSPI2**

CN Type: 8-pin header

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-27**

The 8-pin EC SPI Flash connector is used to flash the BIOS.

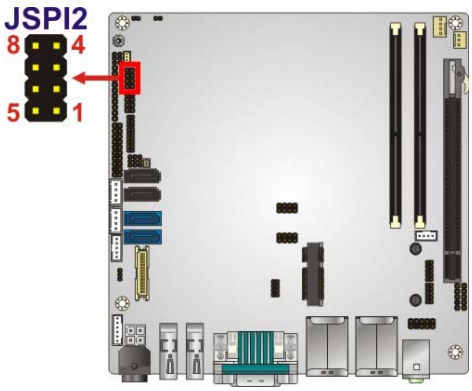


Figure 3-26: EC SPI Flash Connector Location

Pin	Description
1	+V3.3M_SPI_CON_EC
2	SPI_CS#0_CN_EC
3	SPI_SO_SW_EC
4	NC
5	GND
6	SPI_CLK_SW_EC
7	SPI_SI_SW_EC
8	NC

Table 3-27: EC SPI Flash Connector Pinouts

3.2.26 TPM Connector

CN Label: **TPM1**

CN Type: 20-pin header

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-28**

The Trusted Platform Module (TPM) connector secures the system on bootup.

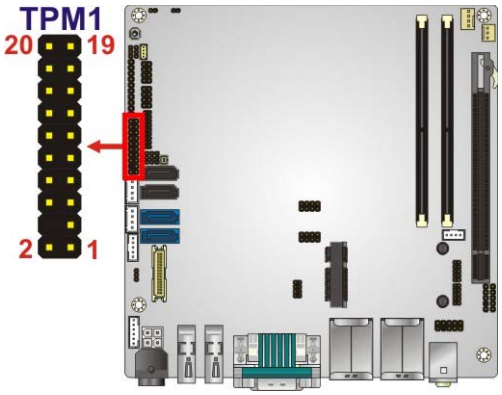


Figure 3-27: TPM Connector Location

Pin	Description	Pin	Description
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-28: TPM Connector Pinouts

3.2.27 USB 2.0 Connectors

CN Label:	**USB1, USB2**
CN Type:	8-pin header
CN Location:	See **Figure 3-28**
CN Pinouts:	See **Table 3-29**

The USB header can connect to two USB devices.

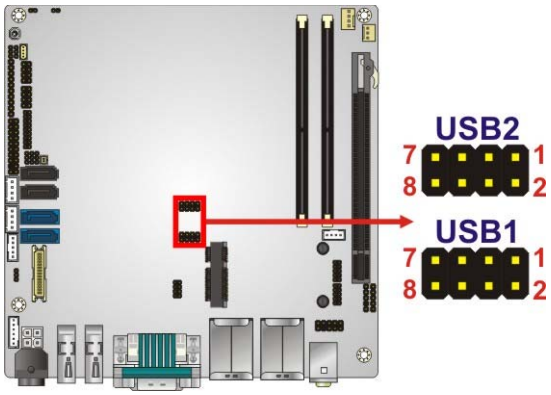


Figure 3-28: USB Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-29: USB Port Connector Pinouts

3.3 External Interface Connectors

Figure 3-29 shows the KINO-QM770 motherboard external interface connectors. The KINO-QM770 on-board external interface connectors are shown in **Figure 3-29.**

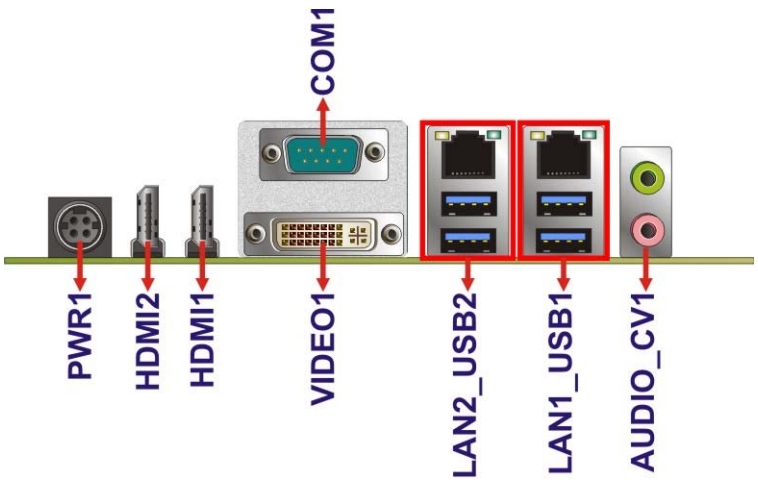


Figure 3-29: External Interface Connectors

3.3.1 Audio Connector

CN Label:	**AUDIO_CV1**
CN Type:	Audio jack
CN Location:	See **Figure 3-29**

The audio jacks connect to external audio devices.

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

Figure 3-30: Audio Jacks

3.3.2 DVI Connector

CN Label: **VIDEO1**

CN Type: DVI connector

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-30** and **Figure 3-31**

The 24-pin Digital Visual Interface (DVI) connector connects to high-speed, high-resolution digital displays. The DVI-I connector supports both digital and analog signals. Use the display mode selection jumper to configure the DVI-I connector (see **Section 4.6.4**)

Pin	Description	Pin	Description
C1	BR	V10	Data 1+
C2	BG	V11	GND
C3	BB	V12	N/C
C4	HS	V13	N/C
C5	GND	V14	+5V Power
C5-1	NC	V15	Hot Plug Detect
V1	Data 2-	V16	HPDET
V2	Data 2+	V17	Data 0-
V3	GND	V18	Data 0+
V4	N/C	V19	GND
V5	N/C	V20	N/C
V6	DDC Clock	V21	N/C
V7	DDC Data	V22	N/C

Pin	Description	Pin	Description
V8	VS	V23	DVI_Clock +
V9	Data 1-	V24	DVI_Clock -

Table 3-30: DVI Connector Pinouts

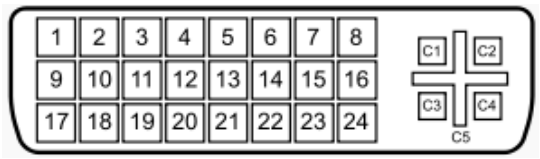


Figure 3-31: DVI-I Connector

3.3.3 Ethernet and USB 3.0 Connectors

CN Label: **LAN1_USB1, LAN2_USB2**

CN Type: RJ-45 and USB 3.0 combo connector

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-31**

The LAN connector connects to a local network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MD0+	5	MD2+
2	MD0-	6	MD2-
3	MD1+	7	MD3+
4	MD1-	8	MD3-

Table 3-31: LAN Pinouts

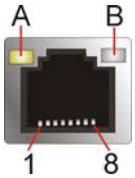


Figure 3-32: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-32: Connector LEDs

The USB 3.0 connector can be connected to a USB device.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND1
5	STDA_SSRX1_N
6	STDA_SSRX1_P
7	GND_DRAIN
8	STDA_SSTX1_N
9	STDA_SSTX1_P

Table 3-33: USB Port Pinouts

3.3.4 HDMI Connectors

CN Label: **HDMI1, HDMI2**

CN Type: HDMI connector

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-34** and **Figure 3-33**

The HDMI connector connects to a display device with HDMI interface.

Pin	Description	Pin	Description
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA

Pin	Description	Pin	Description
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

Table 3-34: HDMI Connector Pinouts

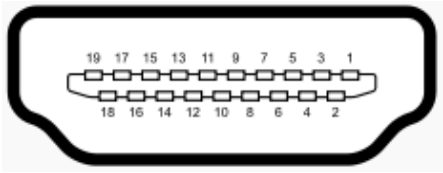


Figure 3-33: HDMI Connector

3.3.5 Power Connector (12 V, Power Adapter)

CN Label: **PWR1**

CN Type: 4-pin Mini-DIN

CN Location: See **Figure 3-29**

CN Pinouts: See **Figure 3-34**

The connector supports the 12V power adapter.

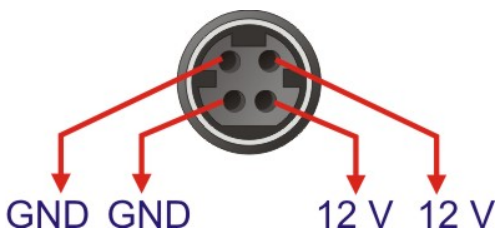


Figure 3-34: 4-pin Power Mini-DIN Connection

3.3.6 Serial Port Connector (COM1)

CN Label: **COM1**

CN Type: DB-9

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-35**

The serial port connects to a RS-232 serial communications device.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD1)	6	DATA SET READY (DSR1)
2	RECEIVE DATA (RXD1)	7	REQUEST TO SEND (RTS1)
3	TRANSMIT DATA (TXD1)	8	CLEAR TO SEND (CTS1)
4	DATA TERMINAL READY (DTR1)	9	RING INDICATOR (RI1)
5	GND		

Table 3-35: Serial Port Pinouts

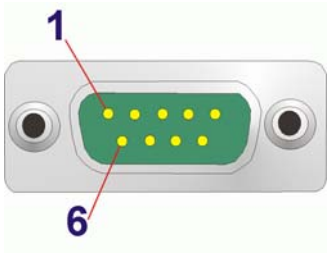


Figure 3-35: Serial Port Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-QM770. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the KINO-QM770, or any other electrical component, is handled.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the KINO-QM770, place it on an antic-static pad. This reduces the possibility of ESD damaging the KINO-QM770.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold it by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-QM770 is installed. All installation notices pertaining to the installation of KINO-QM770 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-QM770 and injury to the person installing the motherboard.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-QM770, KINO-QM770 components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual**:
  - The user manual provides a complete description of the installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power off**:
  - Make sure the product is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-QM770 **DO NOT:**

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 CPU, CPU Cooling Kit and SO-DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, KINO-QM770 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the KINO-QM770. If one of these component is not installed the KINO-QM770 cannot run.

4.3.1 Socket G2 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket G2 CPU onto the KINO-QM770, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 4-1**.

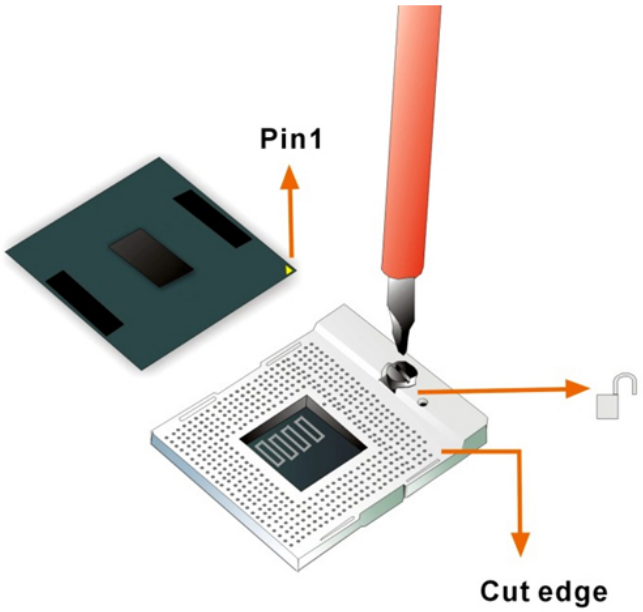


Figure 4-1: Unlock CPU socket retention screw

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 4-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 4-2**.

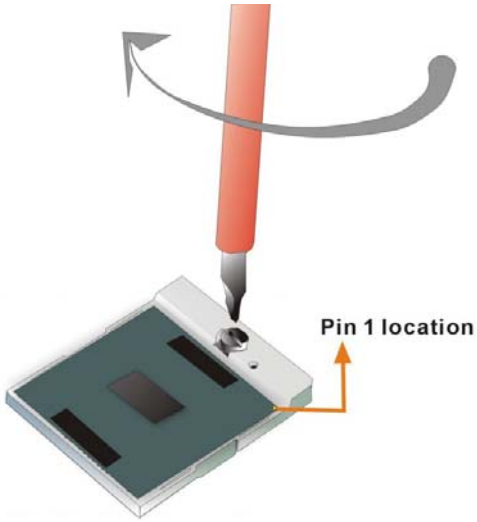


Figure 4-2: Lock the CPU Socket Retention Screw

4.3.2 Socket G2 Cooling Kit Installation

An IEI Socket G2 CPU cooling kit can be purchased separately (See **Chapter 2**). The cooling kit is comprised of a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, please follow the steps below.

Step 1: **Install the support bracket.** Remove the tape from the support bracket. From the solder side of the board, align the support bracket to the holes on board and stick in place.

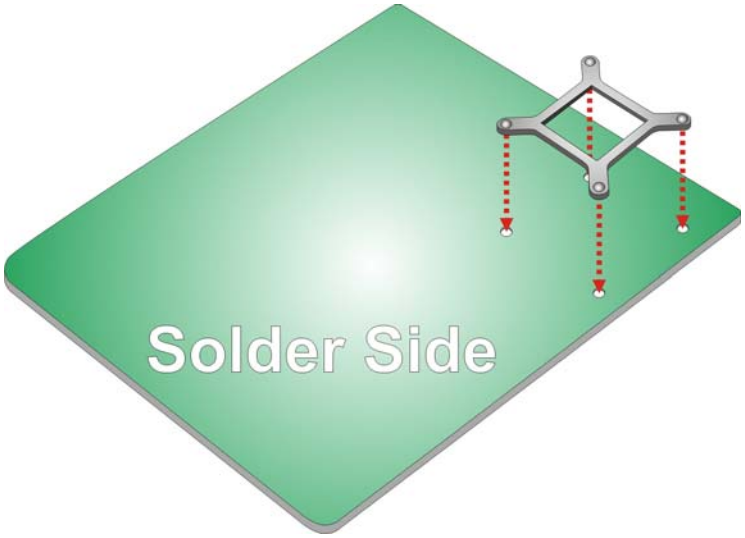


Figure 4-3: Install Support Bracket

Step 2: **Properly orient the cooling kit**. The CPU fan cable must not interfere with the fan or other moving parts. Make sure the cable can be routed away from the moving parts.

Step 3: **Properly align the cooling kit**. Line up the four screws with the screw holes on the support bracket below the board (**Figure 4-4**).

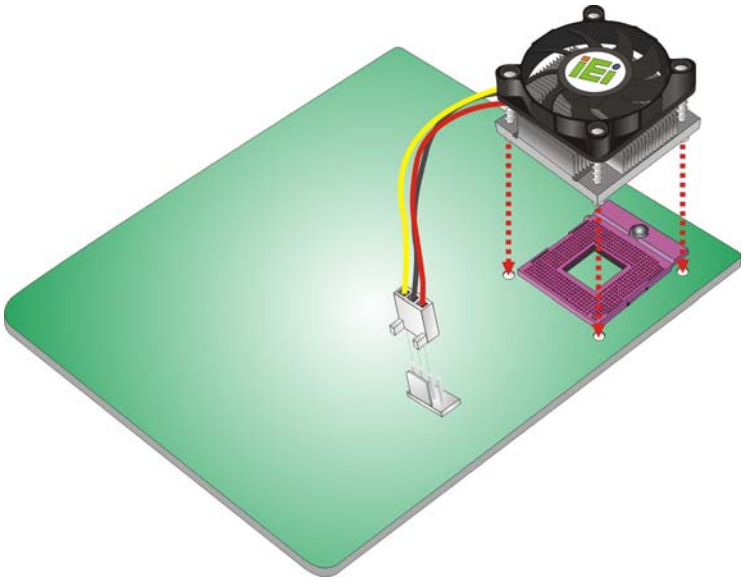


Figure 4-4: Align the Cooling Kit

Step 4: **Place the cooling kit onto the CPU**. Push down the fan with some pressure to secure the cooling kit with the support bracket. See **Figure 4-5**.

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws. See **Figure 4-5**.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the board. Carefully route the cable away from heat generating chips and fan blades.

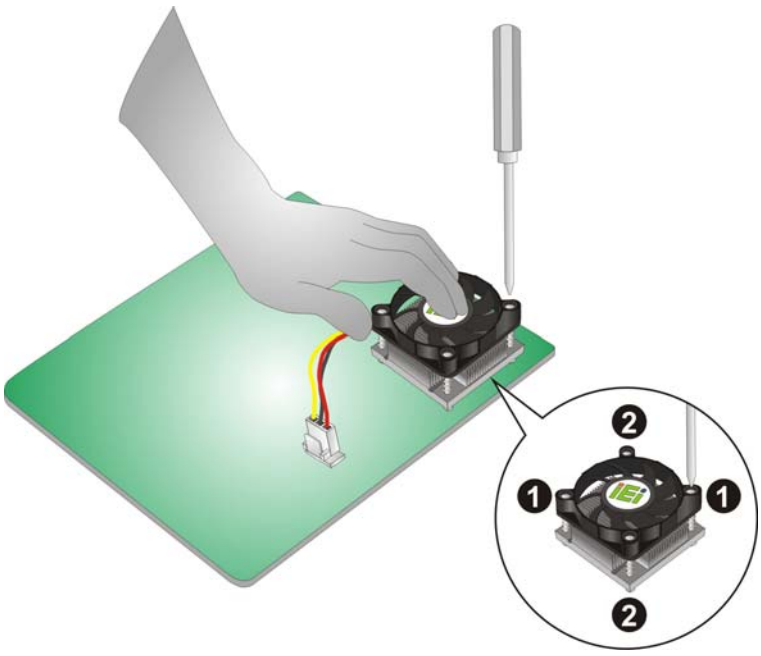


Figure 4-5: Secure the Cooling Kit

4.4 SO-DIMM Installation

To install a SO-DIMM, please follow the steps below and refer to **Figure 4-6**.

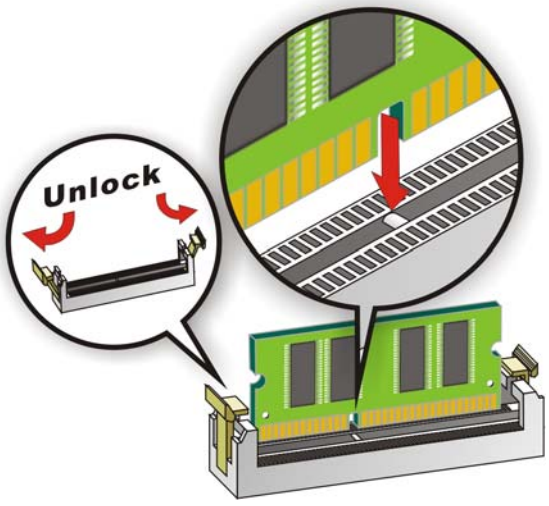


Figure 4-6: SO-DIMM Installation

Step 1: **Open the SO-DIMM socket handles**. Open the two handles outwards as far as they can. See **Figure 4-6**.

Step 2: **Align the SO-DIMM with the socket**. Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.

Step 3: **Insert the SO-DIMM**. Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See **Figure 4-6**.

Step 4: **Removing a SO-DIMM**. To remove a SO-DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.5 PCIe Mini Card Installation

A PCIe Mini card slot is located on the solder side of the KINO-QM770. To install the PCIe Mini card, please refer to the diagram and instructions below.

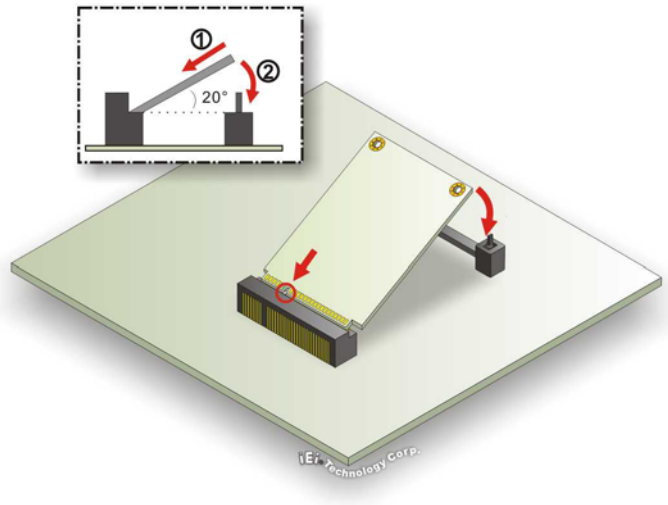


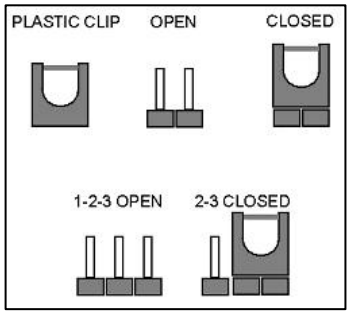
Figure 4-7: PCIe Mini Card Installation

Step 1: **Insert into the socket at an angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º.

Step 2: **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

4.6 Jumper Settings

NOTE:



A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

Before the KINO-QM770 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-QM770 are listed in Table 4-1.

Description	Label	Type
AT/ATX mode selection	J_ATXCTL1	3-pin header
Clear CMOS	J_CMOS1	3-pin header
Clear ME RTC registers	ME_RTC1	3-pin header
Display mode selection (CRT/DVI)	JP1	3-pin header
Flash descriptor security override	J_FLASH1	3-pin header
LVDS voltage selection	J_VLVDS1	3-pin header
LVDS resolution selection	J_PID1	8-pin header
PCIe channel mode selection	J_PCIE1 J_PCIE2	2-pin header

Table 4-1: Jumpers

4.6.1 AT/ATX Mode Selection

Jumper Label: **J_ATXCTL1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-8**

Set both of the jumpers select AT or ATX power mode for the KINO-QM770. AT power mode limits the system to on/off. ATX allows the system to use various power saving states and enter a standby state, so the system can be turned on remotely over a network. The settings on both jumpers should be the same.

Pin	Description
Short 1-2	ATX mode (Default)
Short 2-3	AT mode

Table 4-2: AT/ATX Mode Selection Jumper Settings

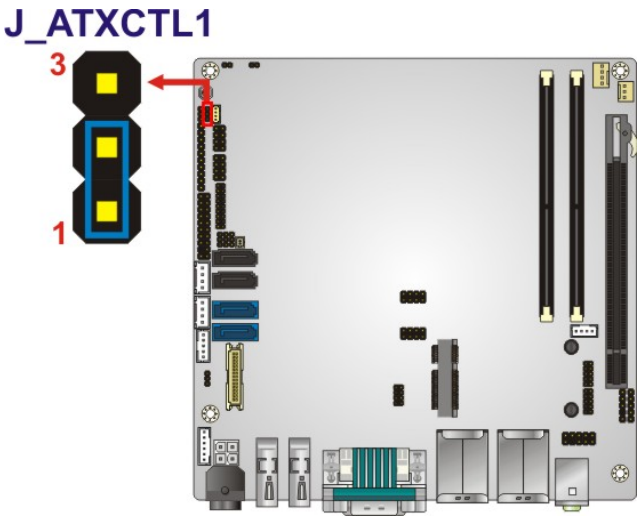


Figure 4-8: AT/ATX Mode Selection Jumper Location

4.6.2 Clear CMOS

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-3**

Jumper Location: See **Figure 4-9**

If the KINO-QM770 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in Table 4-3.

Pin	Description
Short 1-2	Keep CMOS Setup (Default)
Short 2-3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

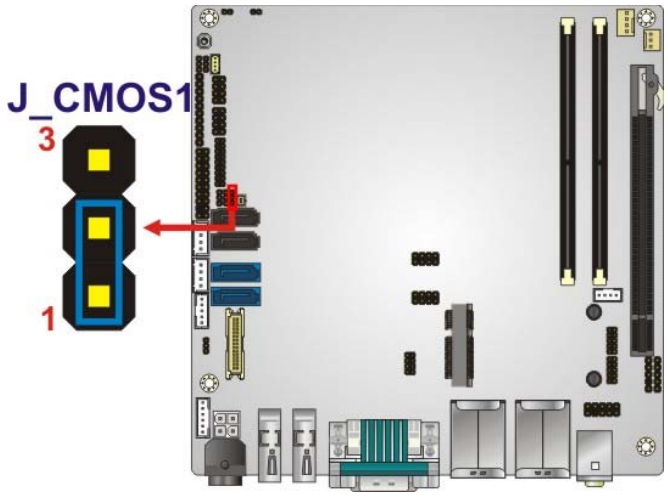


Figure 4-9: Clear CMOS Jumper Location

4.6.3 Clear ME RTC Registers

Jumper Label: **ME_RTC1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-4**

Jumper Location: See **Figure 4-10**

Resets the RTC registers used for the Intel® Management Engine when the on-board battery is changed.

Pin	Description
Short 1-2	Save ME RTC registers (Default)
Short 2-3	Clear ME RTC registers

Table 4-4: Clear ME RTC Registers Jumper Settings

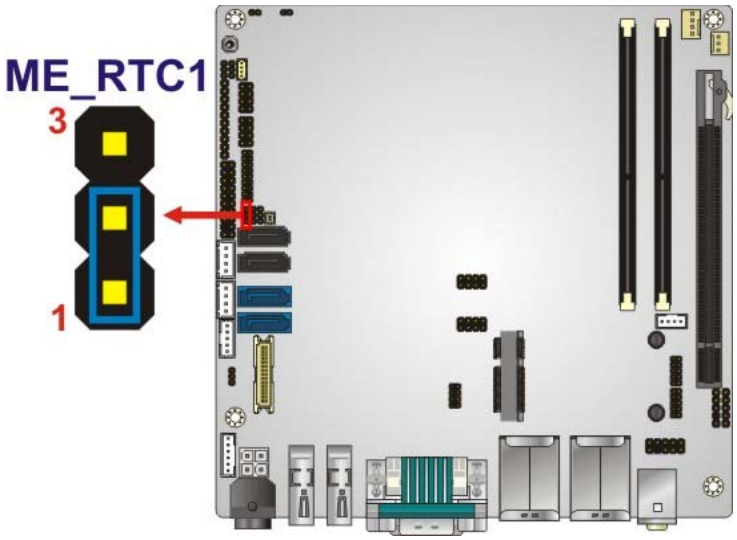


Figure 4-10: Clear ME RTC Registers Jumper Location

4.6.4 Display Mode Selection

Jumper Label: **JP1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-5**

Jumper Location: See **Figure 4-11**

Sets the external DVI-I connector as an analog CRT connector or a DVI connector.

Pin	Description
Short 1-2	DVI (Default)
Short 2-3	CRT

Table 4-5: Display Mode Selection Jumper Settings

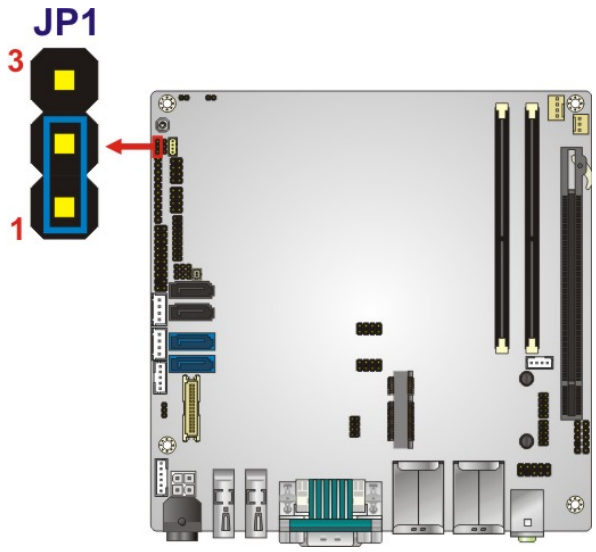


Figure 4-11: Display Mode Selection Jumper Location

4.6.5 Flash Descriptor Security Override

Jumper Label: **J_FLASH1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-6**

Jumper Location: See **Figure 4-12**

The Flash Descriptor Security Override jumper specifies whether to override the flash descriptor.

Setting	Description
Short 1-2	Disabled (Default)
Short 2-3	Enabled

Table 4-6: Flash Descriptor Security Override Jumper Settings

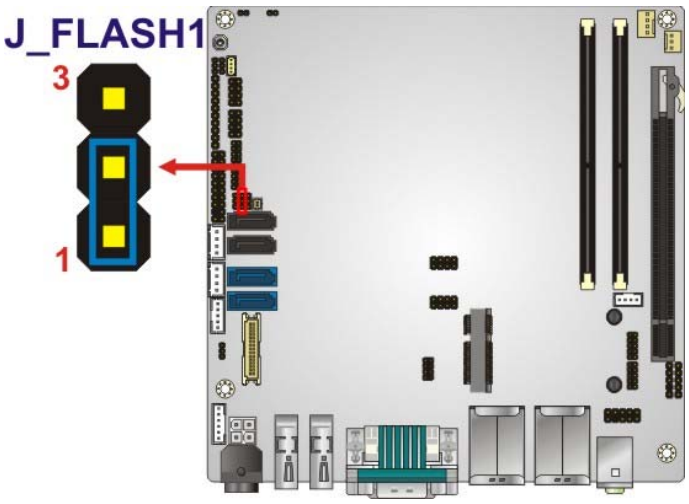


Figure 4-12: Flash Descriptor Security Override Jumper Location

4.6.6 LVDS Voltage Selection

Jumper Label: **J_VLVDS1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-7**

Jumper Location: See **Figure 4-13**

Selects the voltage of the LVDS connector.

Pin	Description
Short 1-2	+3.3 V (Default)
Short 2-3	+5 V

Table 4-7: LVDS Voltage Selection Jumper Settings

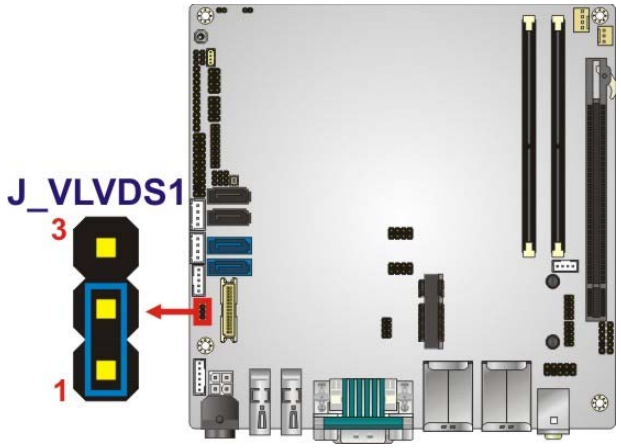


Figure 4-13: LVDS Voltage Selection Jumper Location

4.6.7 LVDS Resolution Selection

Jumper Label: **J_PID1**

Jumper Type: 8-pin header

Jumper Settings: See **Table 4-8**

Jumper Location: See **Figure 4-14**

Selects the resolution of the LCD panel connected to the LVDS connector.

Pin	Description
OPEN	640 X 480 (18bit)
1-2	800 X 600 (18bit)
3-4	1024 X 768 (18bit)
1-2 & 3-4	1024 X 768 (24bit) Default
5-6	1280 X 800 (24bit)
1-2 & 5-6	1280 X 1024 (48bit)
3-4 & 5-6	1366 X 768 (24bit)
1-2 & 3-4 & 5-6	1440 X 900 (48bit)
7-8	1400 X 1050 (48bit)
1-2 & 7-8	1600 X 900 (48bit)
3-4 & 7-8	1600 X 1200 (48bit)
1-2 & 3-4 & 7-8	1680 X 1050 (48bit)

Pin	Description
5-6 & 7-8	1920 X 1080 (48bit)
1-2 & 5-6 & 7-8	1920 X 1200 (48bit)
3-4 & 5-6 & 7-8	2048 X 1536 (48bit)
1-2 & 3-4 & 5-6 & 7-8	LVDS disabled

Table 4-8: LVDS Resolution Selection Jumper Settings

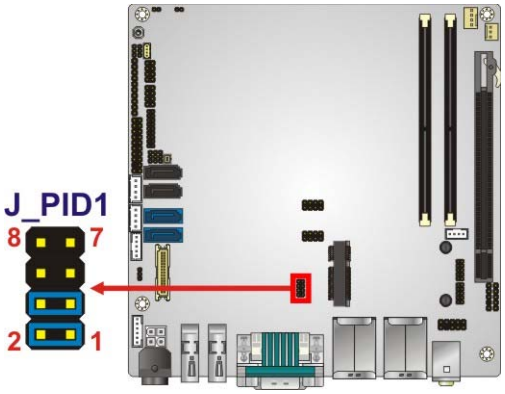


Figure 4-14: LVDS Resolution Selection Jumper Location

4.6.8 PCIe Channel Mode Selection

Jumper Label: **J_PCIE1, J_PCIE2**

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-9**

Jumper Location: See **Figure 4-15**

Sets the PCIe x16 slot channel mode.

J_PCIE1	J_PCIE2	Description
Open	Open	PCIe x16 (Default)
Open	Closed	Reserved
Closed	Open	PCIe x8, PCIe x8
Closed	Closed	PCIe x8, PCIe x4, PCIe x4

Table 4-9: PCIe Channel Mode Selection Jumper Settings

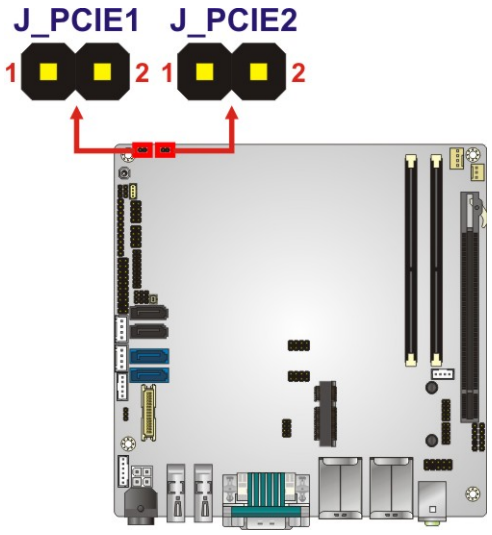


Figure 4-15: PCIe Channel Mode Selection Jumper Location

4.7 Chassis Installation

4.7.1 Airflow

WARNING:

Airflow is critical for keeping components within recommended operating termperatures. The chassis should have fans and vents as necessary to keep things cool.

The KINO-QM770 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.7.2 Motherboard Installation

To install the KINO-QM770 motherboard into the chassis please refer to the reference material that came with the chassis.

4.8 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.8.1 SATA Drive Connection

The KINO-QM770 is shipped with two SATA drive cable. To connect the SATA drive to the connector, please follow the steps below.

Step 1: **Locate the SATA connector and the SATA power connector**. The locations of the connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-16**.

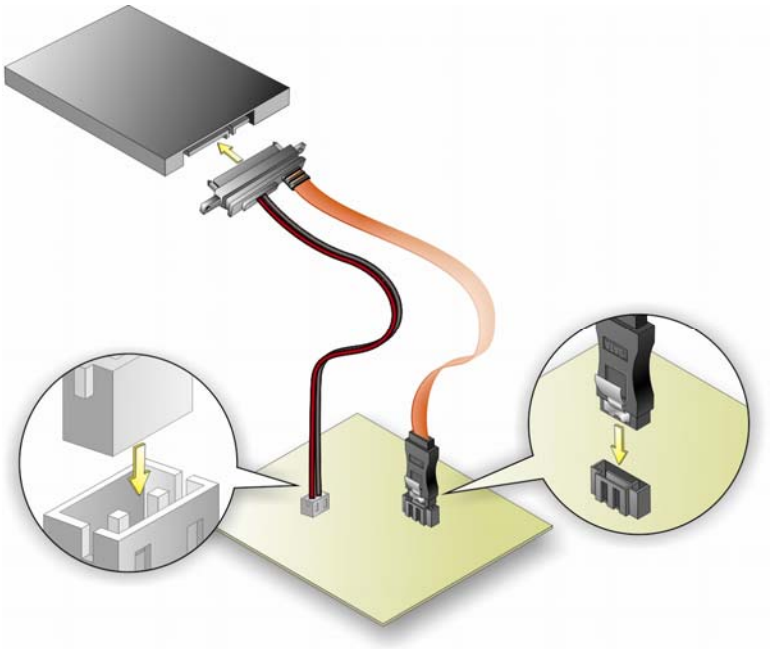


Figure 4-16: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-16**.

Step 4: To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

4.8.2 Single RS-232 Cable (w/o Bracket)

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port pin header. See Figure 4-17. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

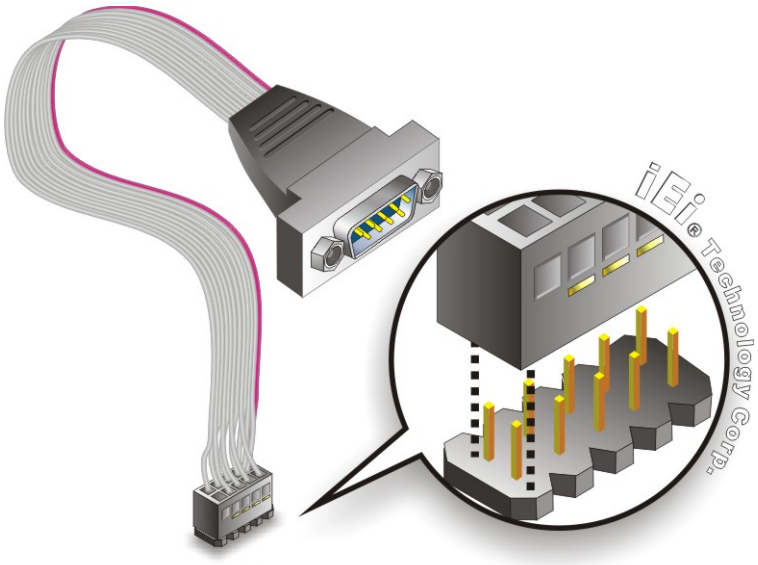


Figure 4-17: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 4: **Connect the serial device**. Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

4.9 External Peripheral Interface Connection

Devices can be connected to the external connectors. To install external devices, follow the directions in the subsections below.

4.9.1 Audio Connector

The audio jacks on the external audio connector enable the KINO-QM770 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: **Plug the audio plugs into the audio jacks**. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

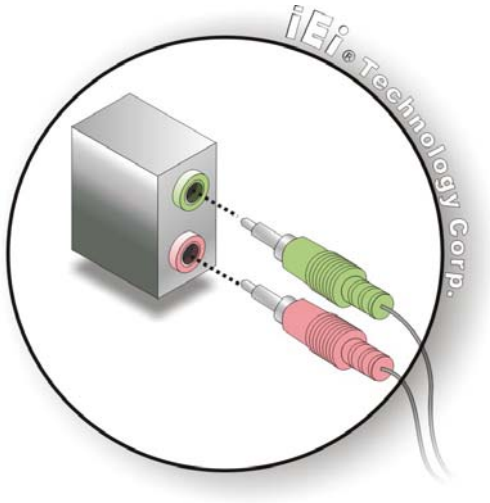


Figure 4-18: Audio Connector

Step 3: **Check audio clarity**. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

4.9.2 DVI Display Device Connection

The KINO-QM770 has a single female DVI-I connector on the external peripheral interface panel. The DVI-I connector is connected to a digital display device. To connect a digital display device to the KINO-QM770, please follow the instructions below.

Step 1: **Locate the DVI-I connector**. The location of the DVI-I connector is shown in another chapter.

Step 2: **Align the DVI-I connector**. Align the male DVI-I connector on the digital display device cable with the female DVI-I connector on the external peripheral interface.

Step 3: **Insert the DVI-I connector** Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the KINO-QM770. See Figure 4-19.

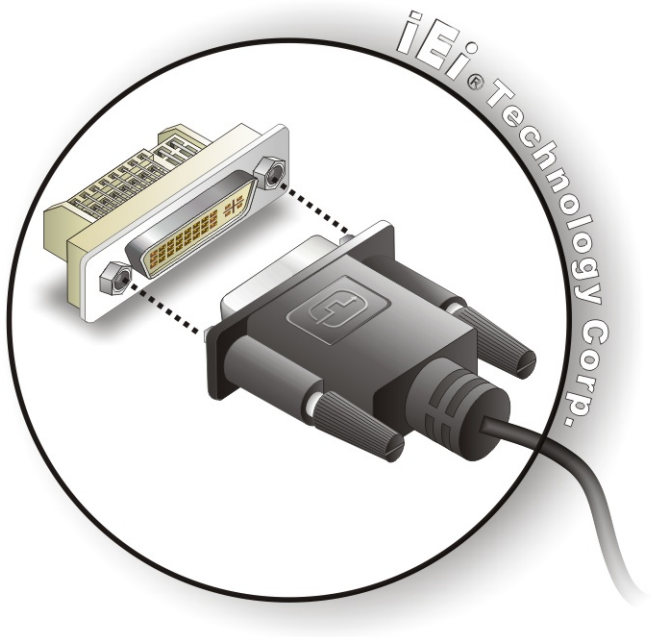


Figure 4-19: DVI Connector

Step 4: **Secure the connector.** Secure the DVI-I connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

4.9.3 HDMI Display Device Connection

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. To connect the HDMI cable to the KINO-QM770, follow the steps below.

Step 1: **Locate the HDMI connector**. The location is shown in **Chapter 3**.

Step 2: **Align the connector.** Align the HDMI connector with the HDMI port. Make sure the orientation of the connector is correct.

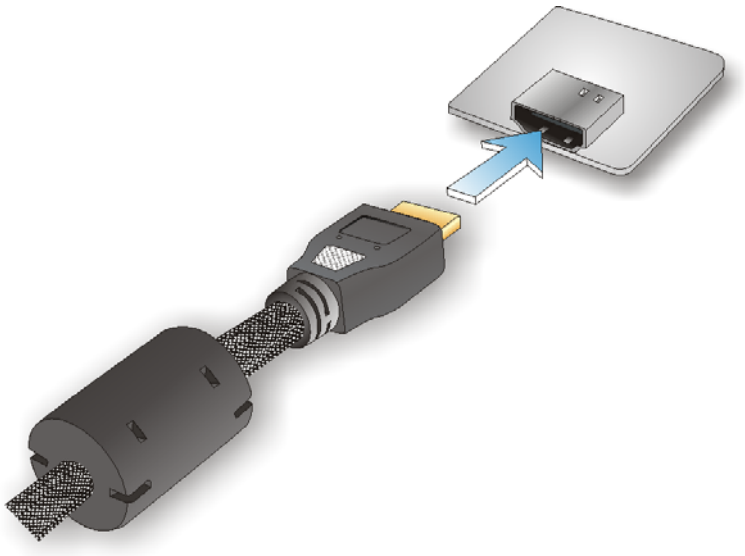


Figure 4-20: HDMI Connection

Step 3: **Insert the HDMI connector.** Gently insert the HDMI connector. The connector should engage with a gentle push. If the connector does not insert easily, check again that the connector is aligned correctly, and that the connector is being inserted with the right way up.

4.9.4 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the KINO-QM770. See Figure 4-21.

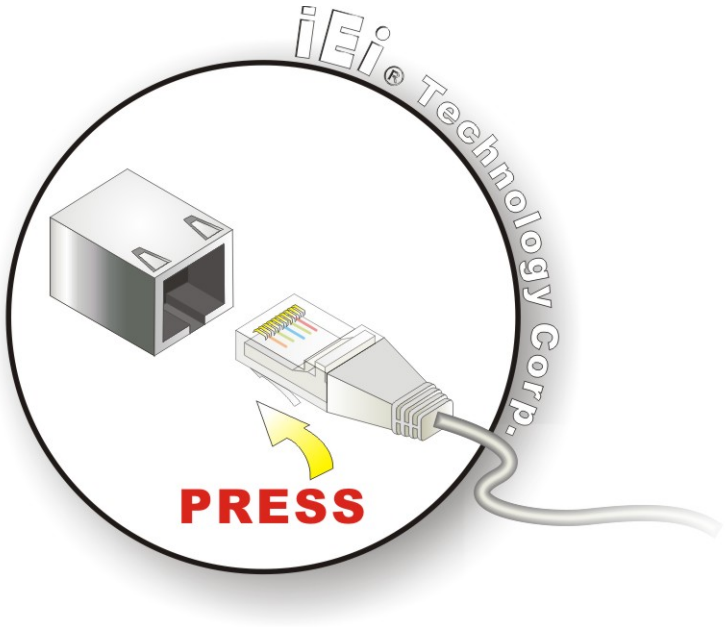


Figure 4-21: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.9.5 USB Connection (Dual Connector)

The external USB 3.0 connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-QM770.

Step 1: **Locate the USB 3.0 connectors**. The locations of the USB 3.0 connectors are shown in **Chapter 3**.

Step 2: **Insert a USB 3.0 plug**. Insert the USB 3.0 plug of a device into the USB 3.0 on the external peripheral interface. See Figure 4-22.

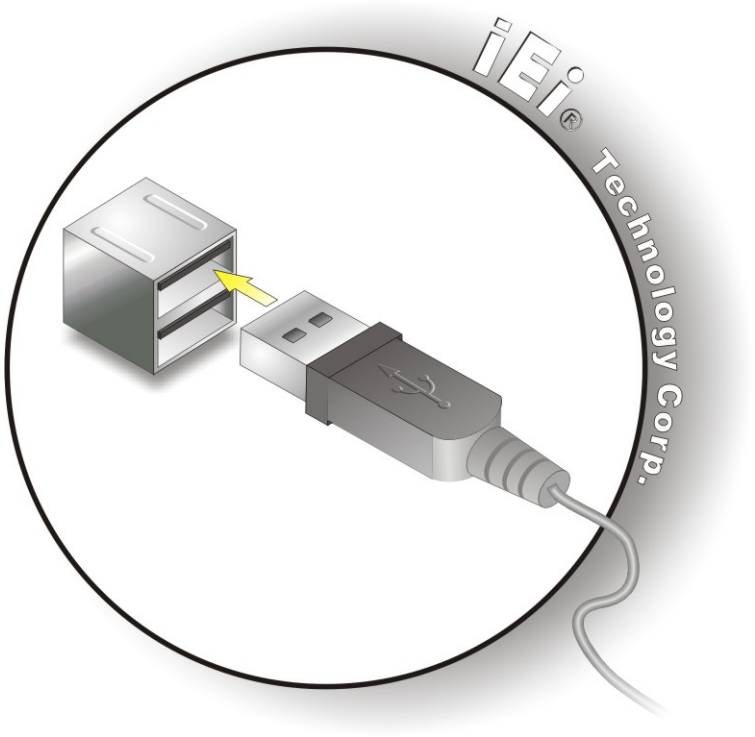


Figure 4-22: USB Connector

4.10 Intel® AMT Setup Procedure

The KINO-QM770 is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

Step 1: Make sure the **DIMM1** socket is installed with one DDR3 SO-DIMM.

Step 2: Connect an Ethernet cable to the RJ-45 connector labeled **LAN1**.

Step 3: The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,

Step 4: Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD. See **Section 6.9**.

Step 5: Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up process. Enter the Intel® current ME password as it requires (the Intel® default password is **admin**).

NOTE:

To change the password, enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters).

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** or **F2** key as soon as the system is turned on or
2. Press the **DELETE** or **F2** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** or **F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page

Key	Function
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **4**.

5.1.5 BIOS Menu Bar

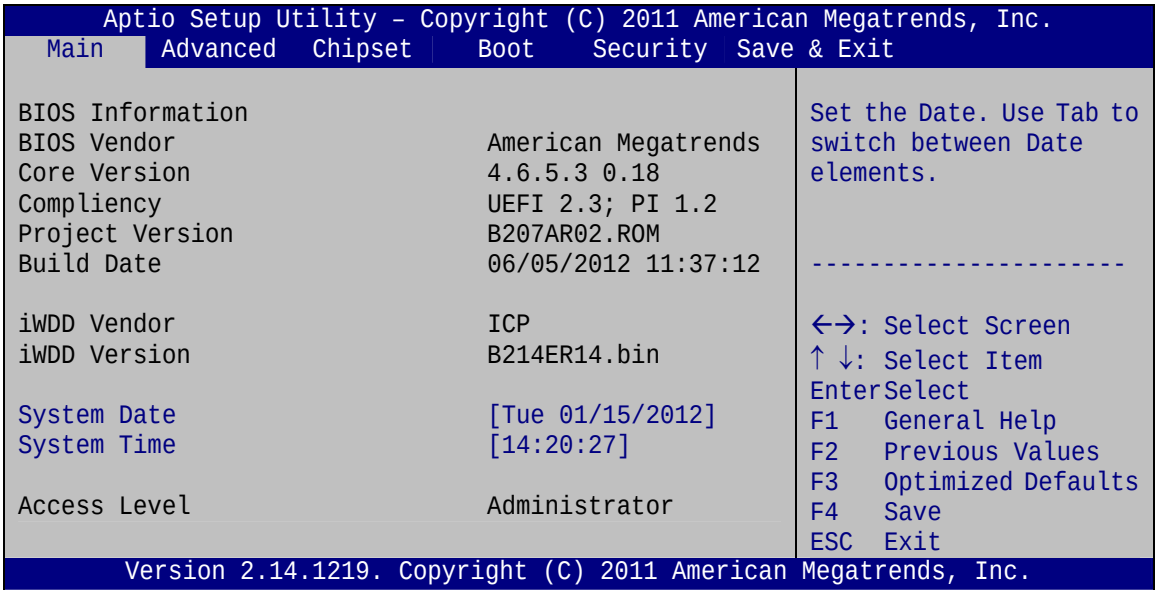
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.3 0.18
Compliency UEFI 2.3; PI 1.2
Project Version B207AR02.ROM
Build Date 06/05/2012 11:37:12
iWDD Vendor ICP
iWDD Version B214ER14.bin
System Date [Tue 01/15/2012]
System Time [14:20:27]
Access Level Administrator
Set the Date. Use Tab to switch between Date elements.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 1: Main

➔ BIOS Information

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

The System Overview field also has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

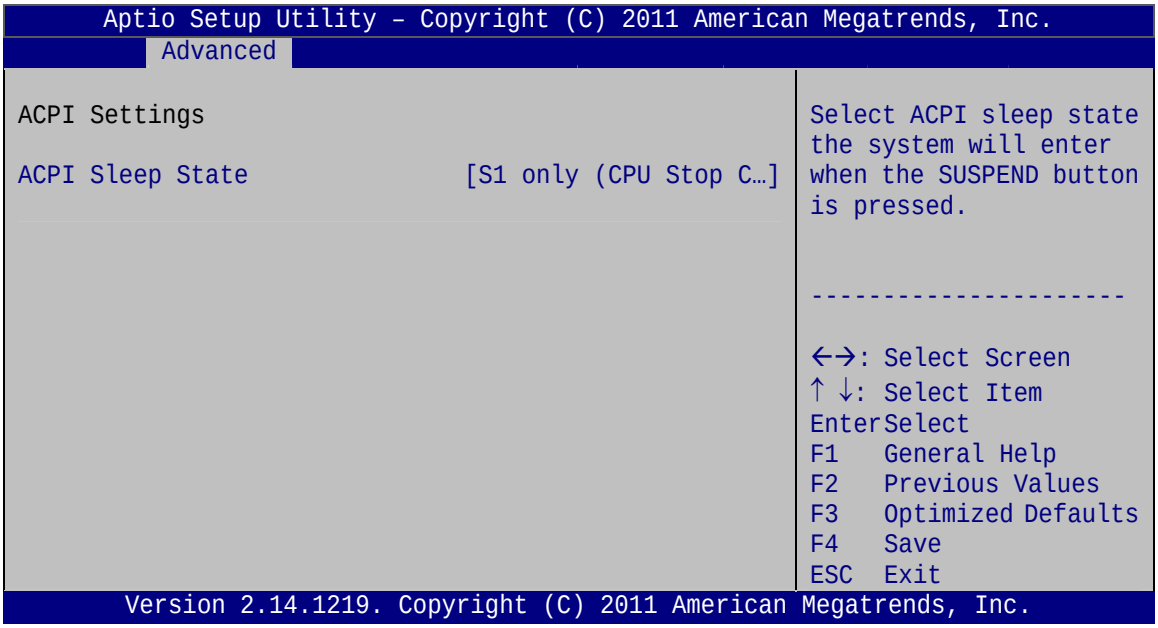
```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main   Advanced  Chipset   Boot   Security  Save & Exit

> ACPI Settings                              System ACPI Parameters
> RTC Wake Settings
> Trusted Computing
> CPU Configuration
> SATA Configuration                         ----------------------
> Intel(R) Rapid Start Technology
> Intel TXT(LT) Configuration                ←→: Select Screen
> AMT Configuration                          ↑ ↓: Select Item
> USB Configuration                          EnterSelect
> F81866 Super IO Configuration              F1   General Help
> F81866 H/W Monitor                         F2   Previous Values
> Serial Port Console Redirection            F3   Optimized Defaults
> iEi Feature                                F4   Save
                                             ESC  Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
ACPI Settings
ACPI Sleep State [S1 only (CPU Stop C…]
Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 3: ACPI Configuration

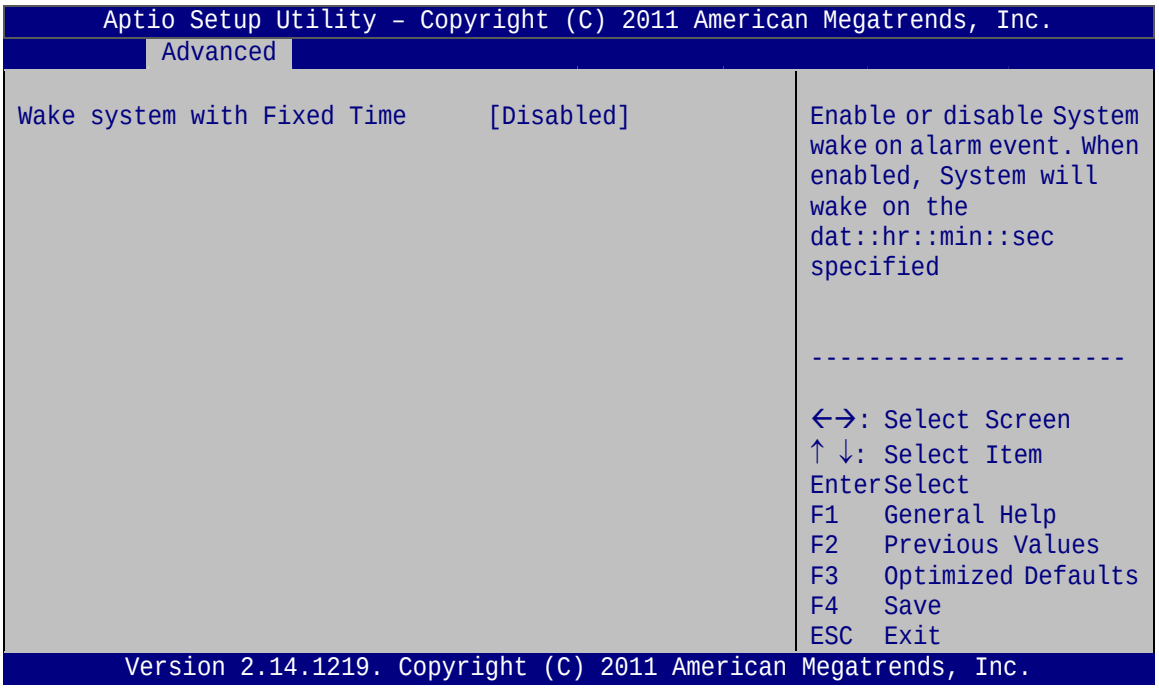
➔ **ACPI Sleep State [S1 only (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S1 only (CPU Stop Clock)**	**DEFAULT**	The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
➔ **S3 only (Suspend to RAM)**		The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Wake system with Fixed Time [Disabled]
Enable or disable System wake on alarm event. When enabled, System will wake on the dat::hr::min::sec specified
----
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 4: RTC Wake Settings

➔ **Wake System with Fixed Time [Disabled]**

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled**

If selected, the following appears with values that can be selected:

*Wake up every day

*Wake up date

*Wake up hour

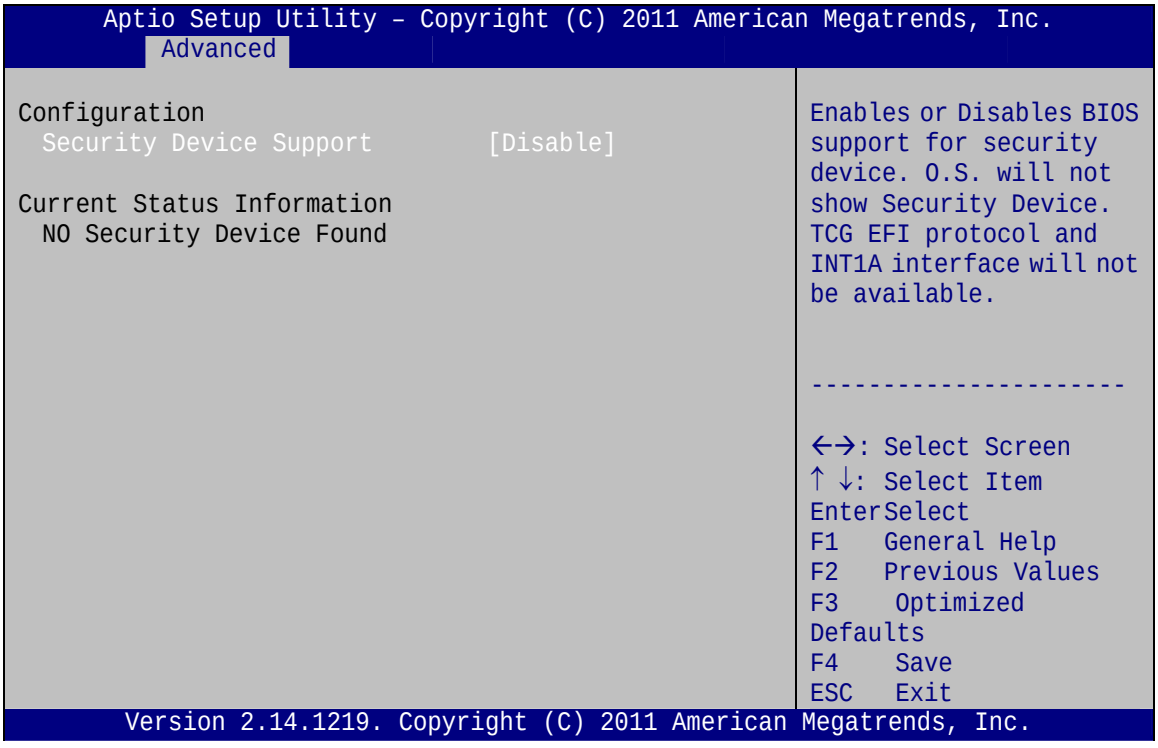
*Wake up minute

*Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 5**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Configuration
Security Device Support [Disable]
Current Status Information
NO Security Device Found
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 5: Trusted Computing

➔ **Security Device Support [Disable]**

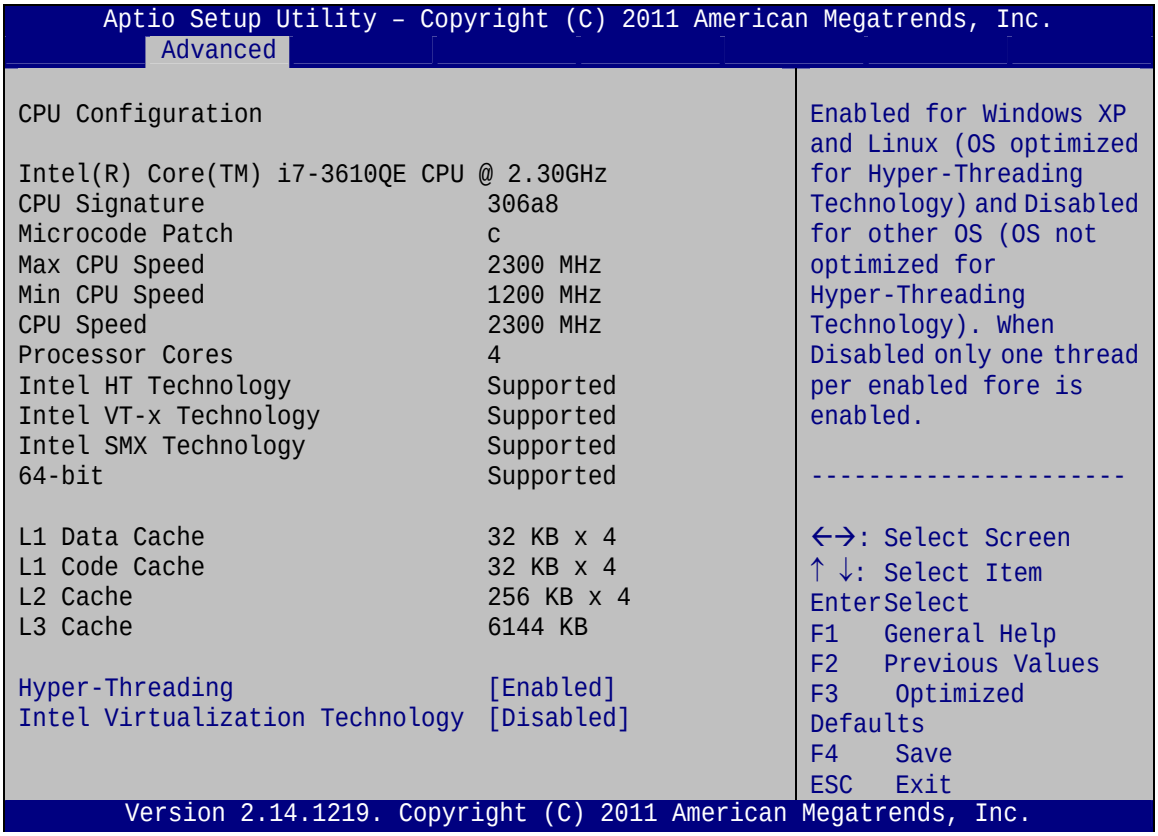
Use the **Security Device Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
CPU Configuration
Intel(R) Core(TM) i7-3610QE CPU @ 2.30GHz
CPU Signature 306a8
Microcode Patch c
Max CPU Speed 2300 MHz
Min CPU Speed 1200 MHz
CPU Speed 2300 MHz
Processor Cores 4
Intel HT Technology Supported
Intel VT-x Technology Supported
Intel SMX Technology Supported
64-bit Supported
L1 Data Cache 32 KB x 4
L1 Code Cache 32 KB x 4
L2 Cache 256 KB x 4
L3 Cache 6144 KB
Hyper-Threading [Enabled]
Intel Virtualization Technology [Disabled]
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled fore is enabled.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.

- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed
- Processor Core: Lists the number of the processor cores
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- 64-bit: Indicates if 64-bit is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ **Hyper Threading [Enabled]**

Use the **Hyper Threading** to enable or disable the CPU hyper threading function.

➔ **Disabled**		Disables the use of hyper threading technology
➔ **Enabled**	**DEFAULT**	Enables the use of hyper threading technology

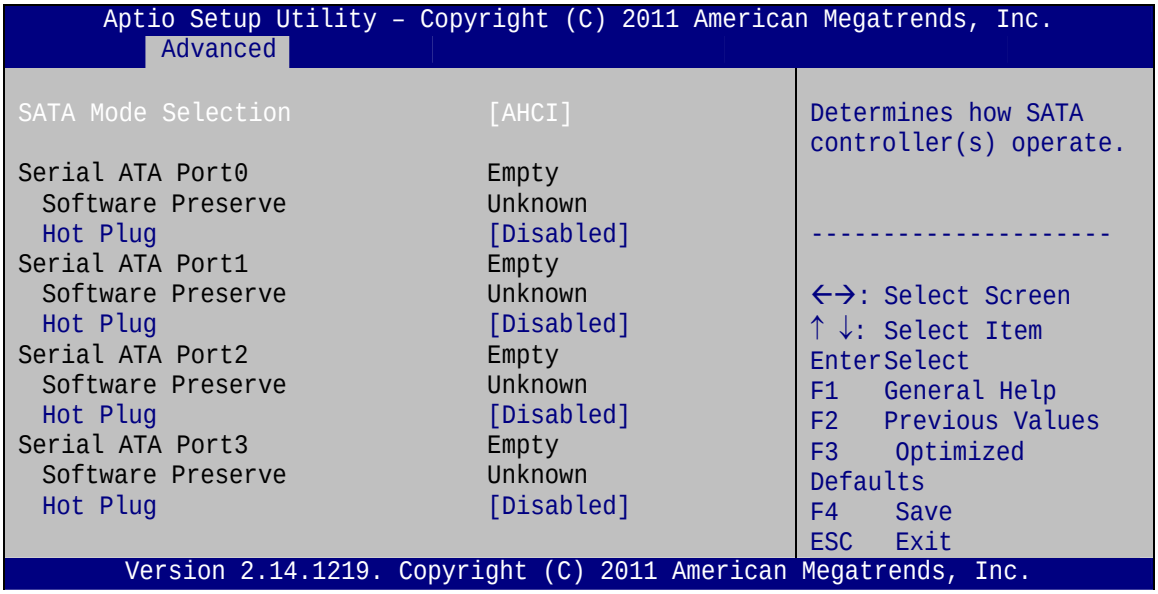
➔ **Intel Virtualization Technology [Disabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**	**DEFAULT**	Disables Intel Virtualization Technology.
➔ **Enabled**		Enables Intel Virtualization Technology.

5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 7: SATA Configuration

➔ **SATA Mode Selection [AHCI]**

Use the **SATA Mode Selection** option to configure SATA devices as normal IDE devices.

➔	**IDE**		Configures SATA devices as normal IDE device.
➔	**AHCI**	**DEFAULT**	Configures SATA devices as AHCI device.
➔	**RAID**		Configures SATA devices as RAID device.

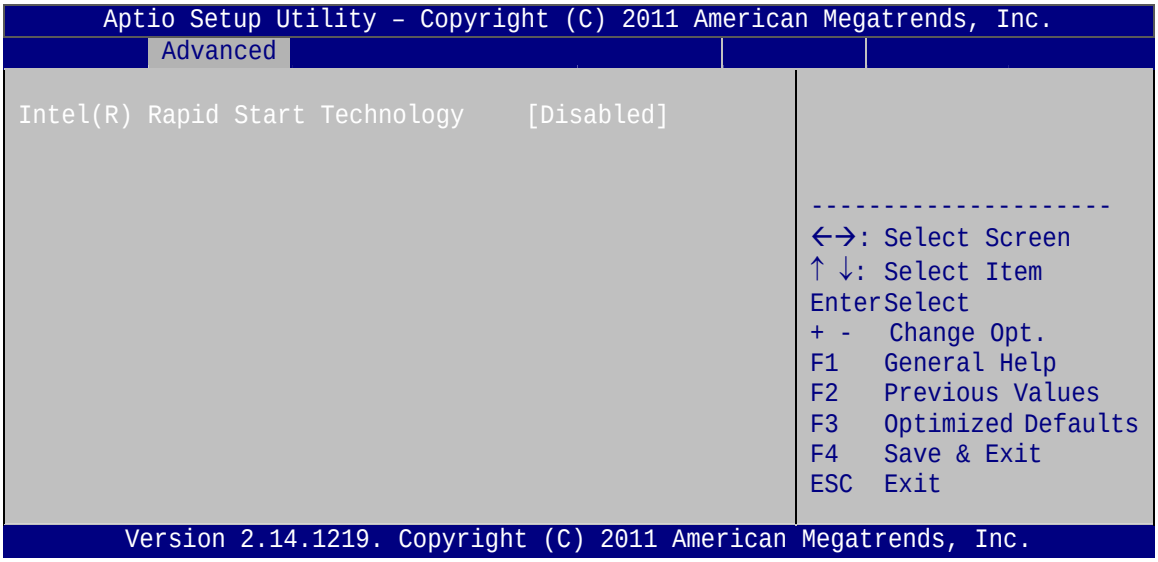
➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the hot plug function.

➔	**Disabled**	**DEFAULT**	Disables the hot plug function.
➔	**Enabled**		Enables the hot plug function.

5.3.6 Intel(R) Rapid Start Technology

Use the **Intel(R) Rapid Start Technology** menu to configure Intel® Rapid Start Technology support.



BIOS Menu 8: Intel(R) Rapid Start Technology

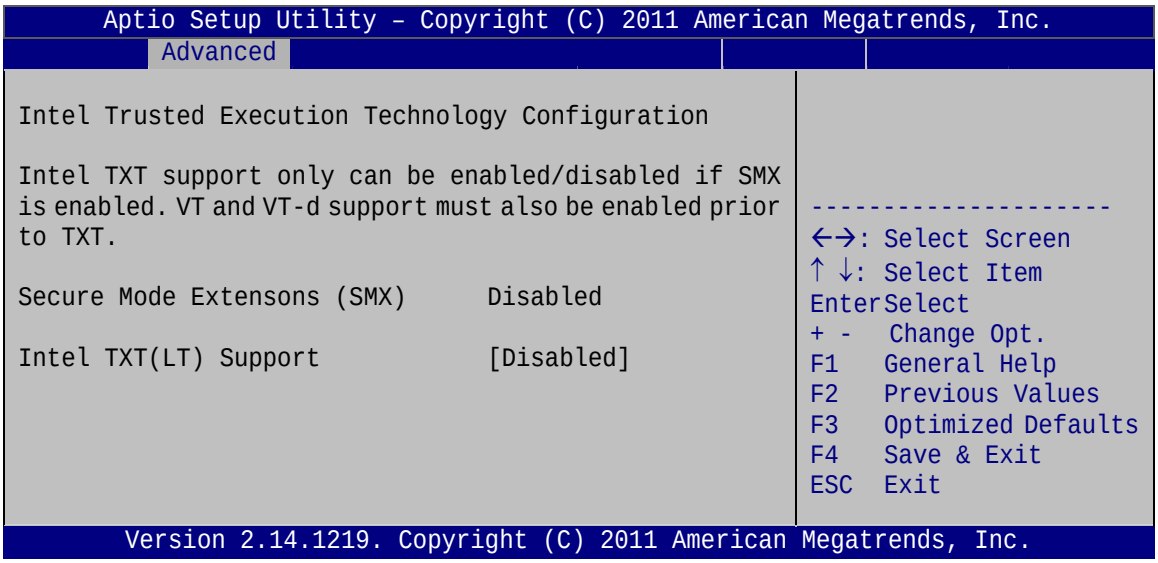
➔ **Intel(R) Rapid Start Technology [Disabled]**

Use **Intel(R) Rapid Start Technology** option to enable or disable the Intel® Rapid Start Technology function.

➔	**Disabled**	**DEFAULT**	Intel® Rapid Start Technology is disabled
➔	**Enabled**		Intel® Rapid Start Technology is enabled

5.3.7 Intel TXT(LT) Configuration

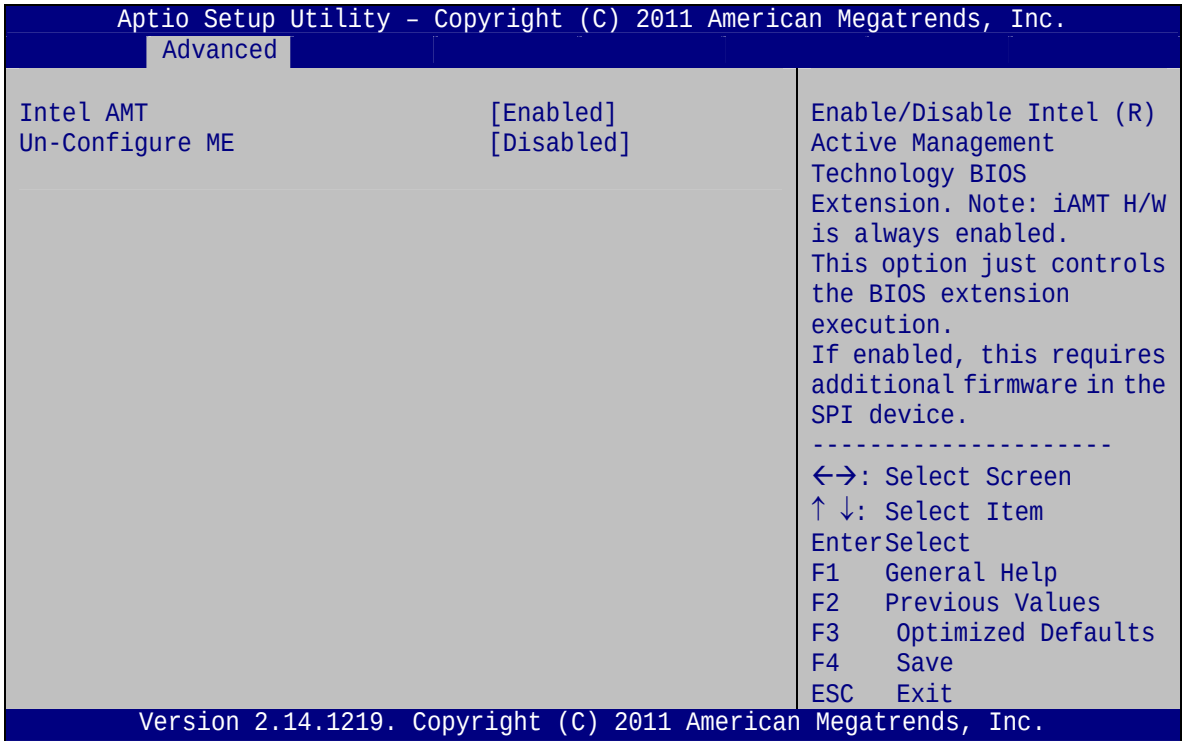
Use the **Intel TXT(LT) Configuration** menu to configure Intel® Trusted Execution Technology support.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel Trusted Execution Technology Configuration
Intel TXT support only can be enabled/disabled if SMX is enabled. VT and VT-d support must also be enabled prior to TXT.
Secure Mode Extensons (SMX) Disabled
Intel TXT(LT) Support [Disabled]
←→: Select Screen
↑ ↓: Select Item
Enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 9: Intel TXT(LT) Configuration

5.3.8 AMT Configuration

The **AMT Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel AMT [Enabled]
Un-Configure ME [Disabled]
Enable/Disable Intel (R) Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled.
This option just controls the BIOS extension execution.
If enabled, this requires additional firmware in the SPI device.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 10: AMT Configuration

➔ **Intel AMT [Enabled]**

Use **Intel AMT** option to enable or disable the Intel® AMT function.

➔ **Disabled**		Intel® AMT is disabled
➔ **Enabled**	**DEFAULT**	Intel® AMT is enabled

➔ **Un-Configure ME [Disabled]**

Use the **Un-Configure ME** option to perform ME unconfigure without password operation.

➔ **Disabled**	**DEFAULT**	Not perform ME unconfigure
➔ **Enabled**		To perform ME unconfigure

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 11**) to read USB configuration information and configure the USB settings.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
USB Configuration                          Enables Legacy USB
                                           support. AUTO option
USB Devices:                               disables legacy support
      1 Keyboard, 2 Hubs                   if no USB devices are
                                           connected. DISABLE
Legacy USB Support              [Enabled]  option will keep USB
                                           devices available only
                                           for EFI applications.
                                           ---------------------
                                           ←→: Select Screen
                                           ↑ ↓: Select Item
                                           EnterSelect
                                           F1   General Help
                                           F2   Previous Values
                                           F3    Optimized
                                           Defaults
                                           F4    Save
                                           ESC   Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 11: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Disabled**		Legacy USB support disabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

5.3.10 F81866 Super IO Configuration

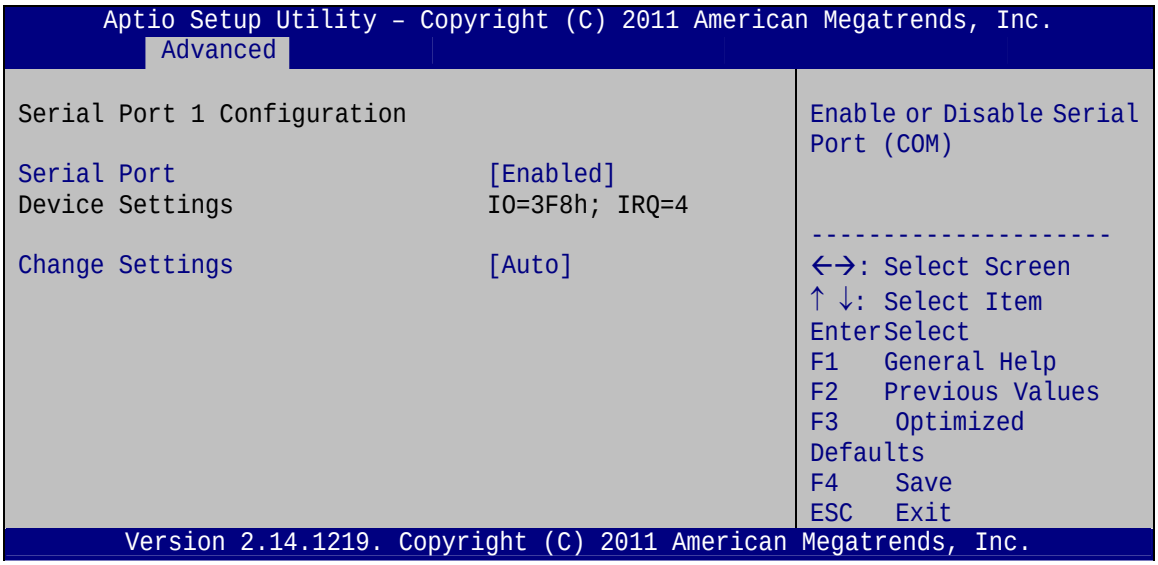
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
F81866 Super IO Configuration                  Set Parameters of Serial
                                               Port 1 (COMA)
F81866 Super IO Chip              F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration                  ----------------------
> Serial Port 3 Configuration                  ←→: Select Screen
                                               ↑ ↓: Select Item
                                               EnterSelect
                                               F1   General Help
                                               F2   Previous Values
                                               F3    Optimized
                                               Defaults
                                               F4    Save
                                               ESC   Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 12: F81866 Super IO Configuration

5.3.10.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 13**) to configure the serial port n.



BIOS Menu 13: Serial Port n Configuration

5.3.10.1.1 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** — Disable the serial port
- ➔ **Enabled** **DEFAULT** — Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=3F8h; IRQ=4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

- **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=3E8h; IRQ=3, 4** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4
- **IO=2E8h; IRQ=3, 4** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.10.1.2 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** — Disable the serial port
- **Enabled** **DEFAULT** — Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- **IO=2F8h; IRQ=3** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=3E8h; IRQ=3, 4** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4

➔ **IO=2E8h; IRQ=3, 4**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.10.1.3 Serial Port 3 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

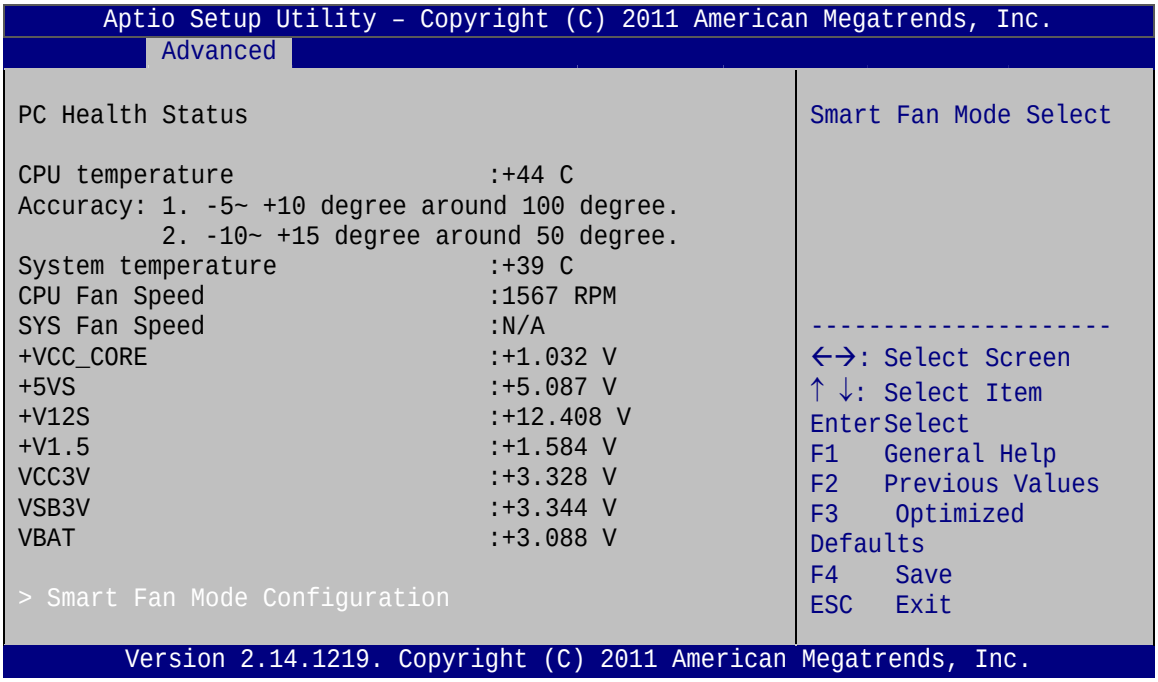
➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=3E8h; IRQ=5**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ5
➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=3E8h; IRQ=5, 7**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ5, 7
➔ **IO=2E8h; IRQ=5, 7**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ5, 7
➔ **IO=2E0h; IRQ=5, 7**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ5, 7

5.3.11 F81866 H/W Monitor

The **F8186 H/W Monitor** menu (**BIOS Menu 14**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 14: F81866 H/W Monitor

➔ **PC Health Status**

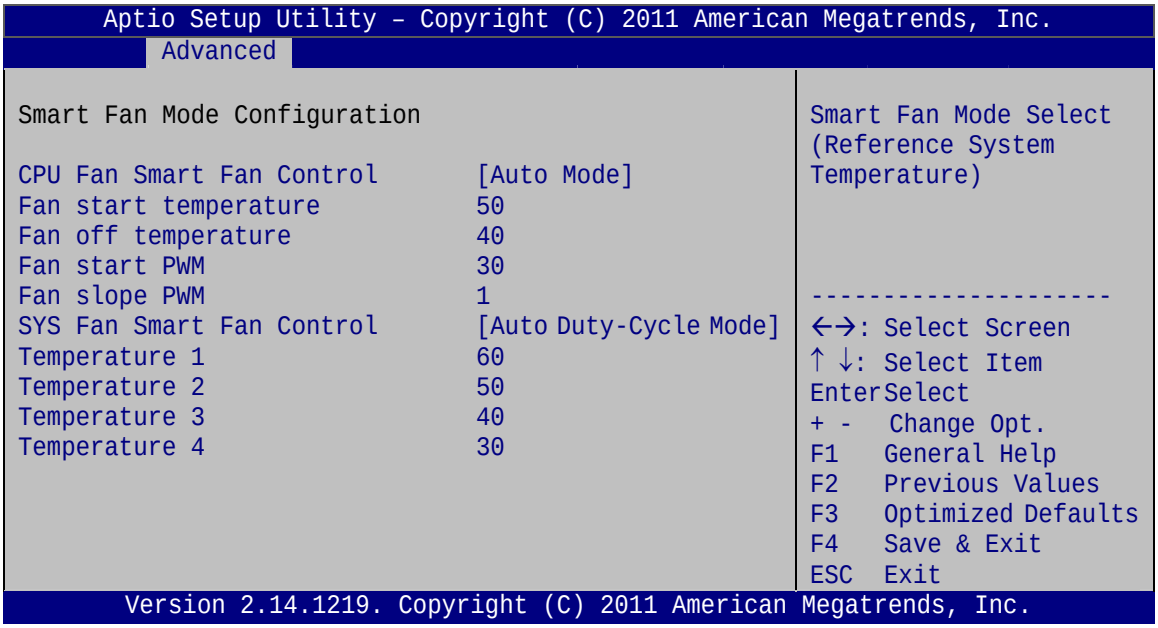
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - +VCC_CORE
  - +5VS
  - +V12S

- +V1.5
- VCC3V
- VSB3V
- VBAT

5.3.11.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 15**) to configure the smart fan temperature and speed settings.



BIOS Menu 15: Smar Fan Mode Configuration

➔ **CPU Fan Smart Fan Control [Auto Mode]**

Use the **CPU_FAN1 Smart Fan Control** option to configure the CPU Smart Fan (CPU_FAN1).

➔ **Manual Mode**		The fan spins at the speed set in Manual by Duty Cycle settings
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto by Duty-Cycle settings

➔ **SYS Fan Smart Fan Control [Auto Duty-Cycle Mode]**

Use the **SYS_FAN1 Smart Fan Control** option to configure the System Smart Fan (SYS_FAN1).

➔ **Manual Duty Mode**	The fan spins at the speed set in Manual by Duty Cycle settings
➔ **Auto Duty-Cycle DEFAULT Mode**	The fan adjusts its speed using Auto by Duty-Cycle settings

➔ **Fan start/off temperature**

Use the + or – key to change the **Fan start/off temperature** value. Enter a decimal number between 1 and 128.

➔ **Fan start PWM**

Use the + or – key to change the **Fan start PWM** value. Enter a decimal number between 1 and 128.

➔ **Fan slope PWM**

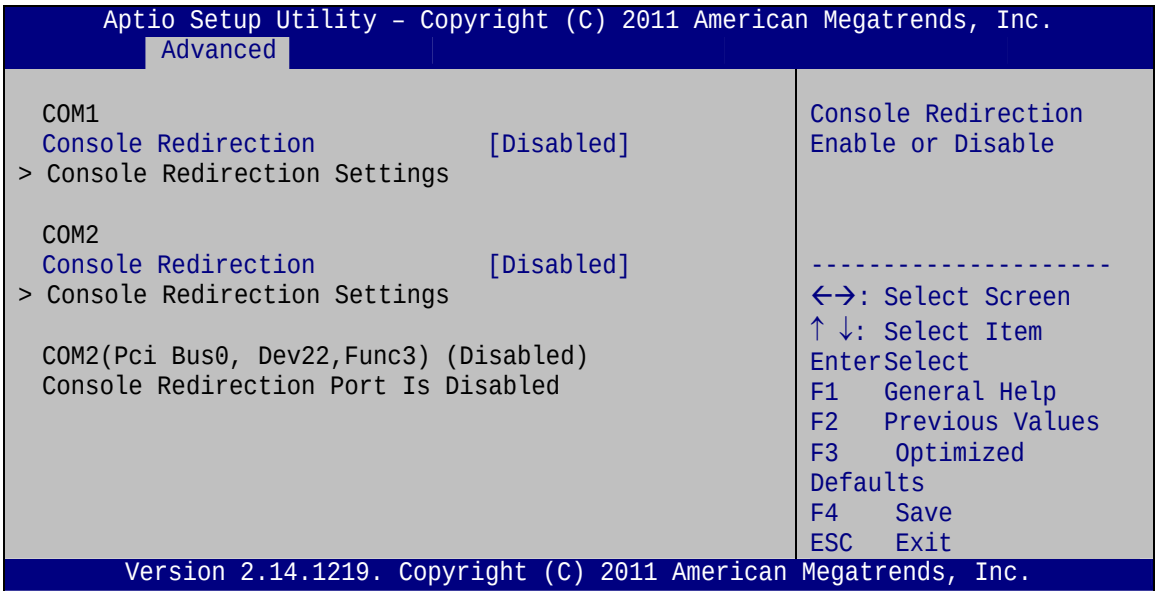
Use the + or – key to change the **Fan slope PWM** value. Enter a decimal number between 1 and 64.

➔ **Temperature n**

Use the + or – key to change the fan **Temperature n** value. Enter a decimal number between 1 and 100.

5.3.12 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 16**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 16: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

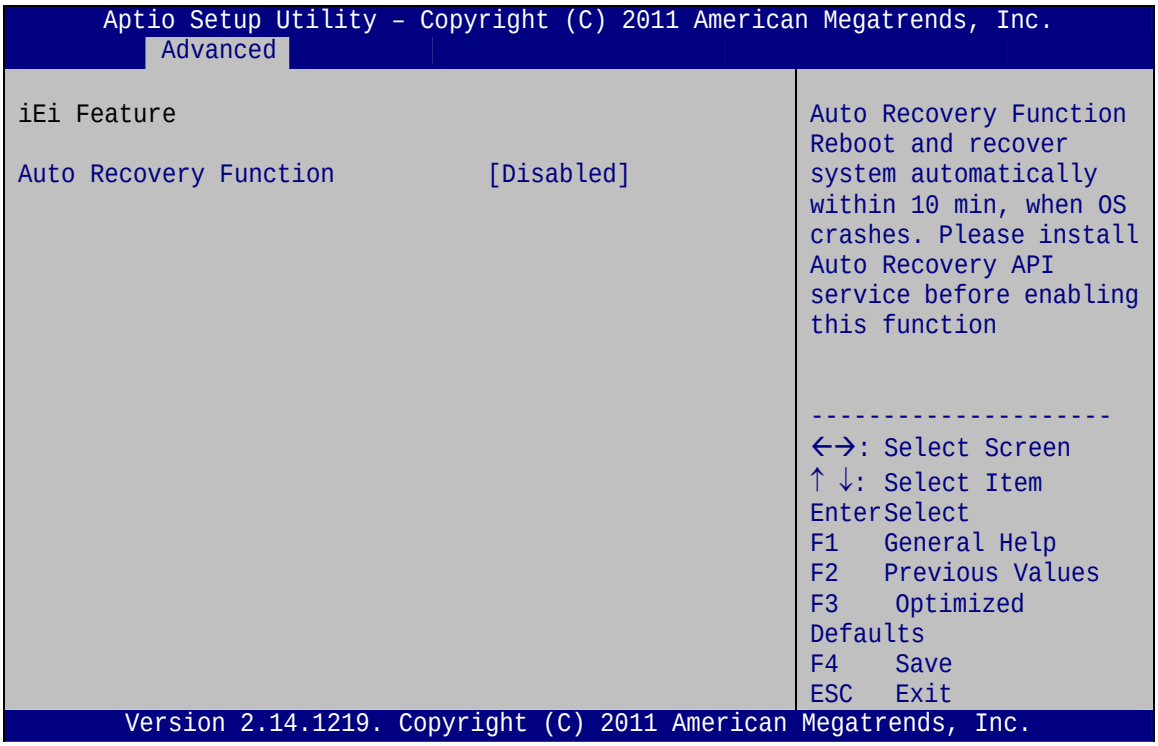
Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled** **DEFAULT** Disabled the console redirection function

➔ **Enabled** Enabled the console redirection function

5.3.13 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 17**) to configure One Key Recovery function.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
iEi Feature
Auto Recovery Function [Disabled]
Auto Recovery Function
Reboot and recover system automatically within 10 min, when OS crashes. Please install Auto Recovery API service before enabling this function
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 17: IEI Feature

➔ **Auto Recovery Function [Disabled]**

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

➔ **Disabled** **DEFAULT** Auto recovery function disabled

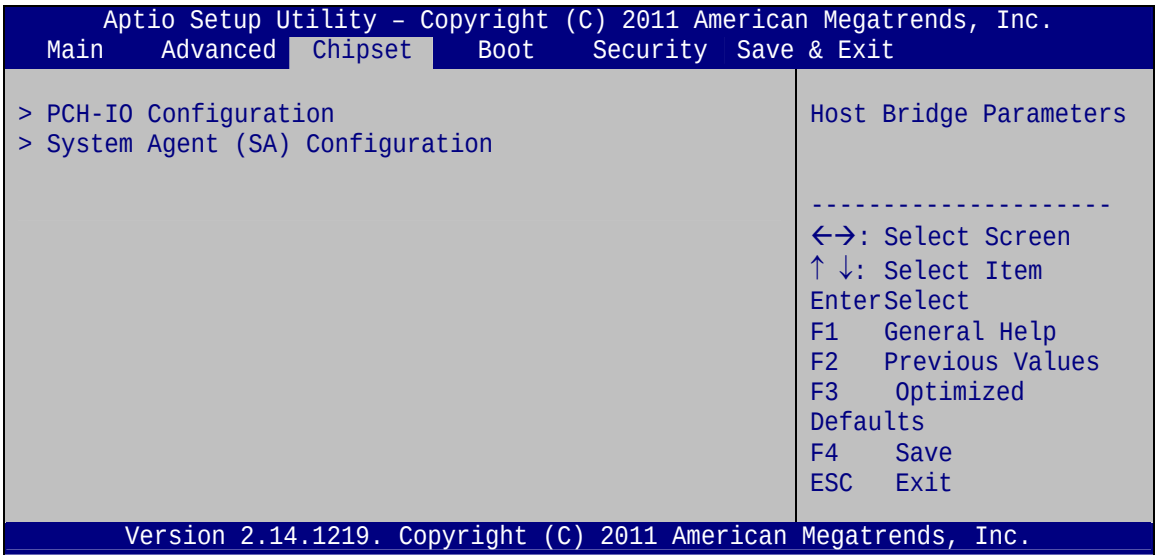
➔ **Enabled** Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the Hostbridge and Southbridge configuration menus.

WARNING!

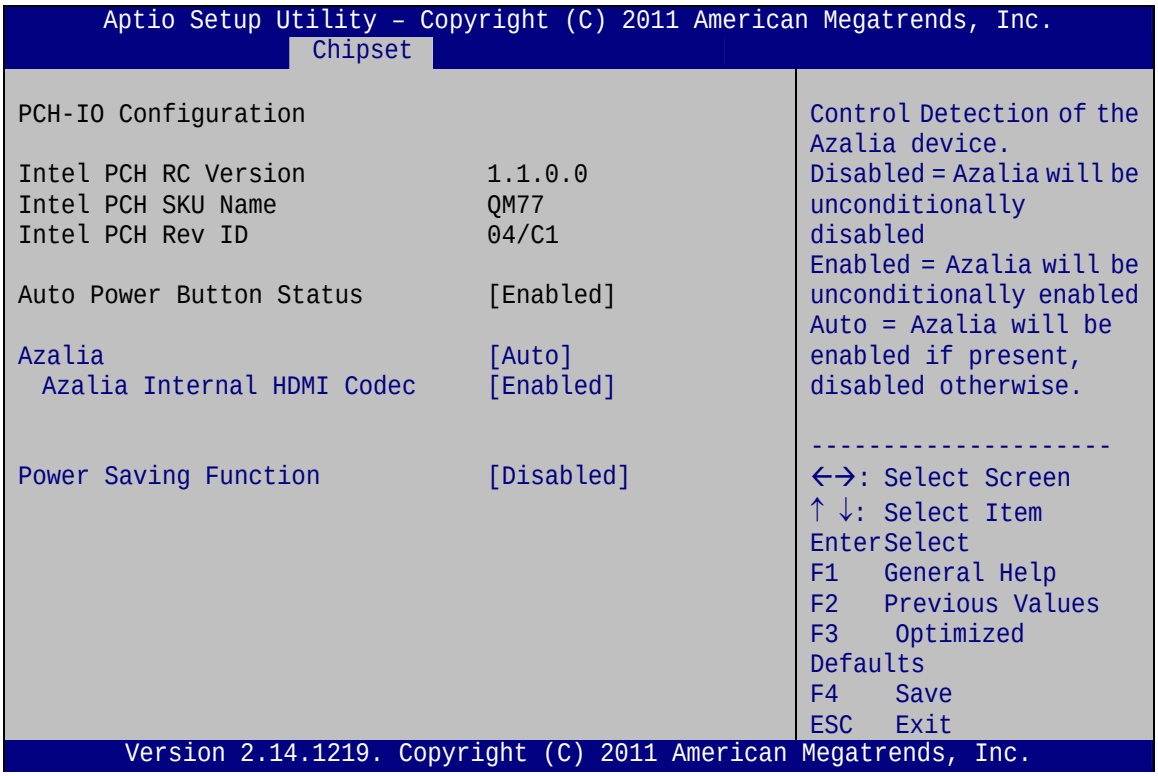
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
> PCH-IO Configuration
> System Agent (SA) Configuration
Host Bridge Parameters
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 18: Chipset

5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 19**) to configure the PCH chipset.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
PCH-IO Configuration
Intel PCH RC Version 1.1.0.0
Intel PCH SKU Name QM77
Intel PCH Rev ID 04/C1
Auto Power Button Status [Enabled]
Azalia [Auto]
Azalia Internal HDMI Codec [Enabled]
Power Saving Function [Disabled]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally enabled
Auto = Azalia will be enabled if present, disabled otherwise.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 19:PCH-IO Configuration

➔ **Azalia [Auto]**

Use the **Azalia** option to enable or disable the High Definition Audio controller.

- ➔ **Disabled** The onboard High Definition Audio controller is disabled
- ➔ **Enabled** The onboard High Definition Audio controller automatically detected and enabled
- ➔ **Auto** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled

➔ **Azalia internal HDMI codec [Enabled]**

Use the **Azalia internal HDMI codec** option to enable or disable the internal HDMI codec for High Definition Audio.

➔ **Disabled** Disable internal HDMI codec for High Definition Audio

➔ **Enabled** **DEFAULT** Enable internal HDMI codec for High Definition Audio

➔ **Power Saving Function [Disabled]**

Use the **Power Saving Function** BIOS option to enable or disable the power saving function.

➔ **Disabled** **DEFAULT** Power saving function is disabled.

➔ **Enabled** Power saving function is enabled. It will reduce power consumption when the system is off.

5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 20**) to configure the Southbridge chipset.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

System Agent Bridge Name          IvyBridge
System Agent RC Version           1.1.0.0
VT-d Capability                   Supported

VT-d                              [Enabled]
> Graphics Configuration
> Memory Configuration

Enabled to reduce power
consumption in system
off state.

---------------------
←→: Select Screen
↑ ↓: Select Item
EnterSelect
F1   General Help
F2   Previous Values
F3    Optimized
Defaults
F4    Save
ESC   Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: System Agent (SA) Configuration

➔ **VT-d [Enabled]**

Use the **VT-d** option to enable or disable VT-d support.

➔ **Disabled**		Disables VT-d support.
➔ **Enabled**	**DEFAULT**	Enables VT-d support.

5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** menu to configure the video device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                    Chipset

Graphics Configuration                  | Select which of
IGFX VBIOS Version          2132        | IGFX/PEG/PCI Graphics
IGfx Frequency              350 MHz     | device should be Primary
                                        | Display Or select SG for
Primary Display             [IGFX]      | Switchable Gfx.
  PEG0 – Gen X              [Gen1]      |
                                        |
DVMT Pre-Allocated          [128M]      | ----------------------
DVMT Total Gfx Mem          [MAX]       | ←→: Select Screen
                                        | ↑ ↓: Select Item
Primary IGFX Boot Display   [VBIOS Default] | EnterSelect
LCD Panel Type              [By  Hardware] | F1   General Help
Backlight Control           [Inverted]  | F2   Previous Values
PID Current Jumper Setting  1024x768 24BIT | F3    Optimized
                                        | Defaults
                                        | F4    Save
                                        | ESC   Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 21: Graphics Configuration

➔ **Primary Display [IGFX]**

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- IGFX **Default**
- PEG

➔ **PEG0 – Gen X [Gen1]**

Use the **PEG0 – Gen X** option to configure PEG0 B0:D1:F0. The following options are available:

- Gen1 **Default**
- Gen2
- Gen3

➔ **DVMT Pre-Allocated [128MB]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 96M
- 128M **Default**
- 256M
- 512M
- 1024M

➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

➔ **Primary IGFX Boot Display [VBIOS Default]**

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**

- DVI
- LVDS
- HDMI 2
- HDMI 1

➔ **LCD Panel Type [By Hardware]**

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- By Hardware **DEFAULT**
- 640x480 18BIT
- 800x600 18BIT
- 1024x768 18BIT
- 1024x768 24BIT
- 1280x800 24BIT
- 1280x1024 48BIT
- 1366x768 24BIT
- 1440x900 48BIT
- 1400x1050 48BIT
- 1600x900 48BIT
- 1600x1200 48BIT
- 1680x1050 48BIT
- 1920x1080 48BIT
- 1920x1200 48BIT
- 2048x1536 48BIT

➔ **Backlight Control [Inverted]**

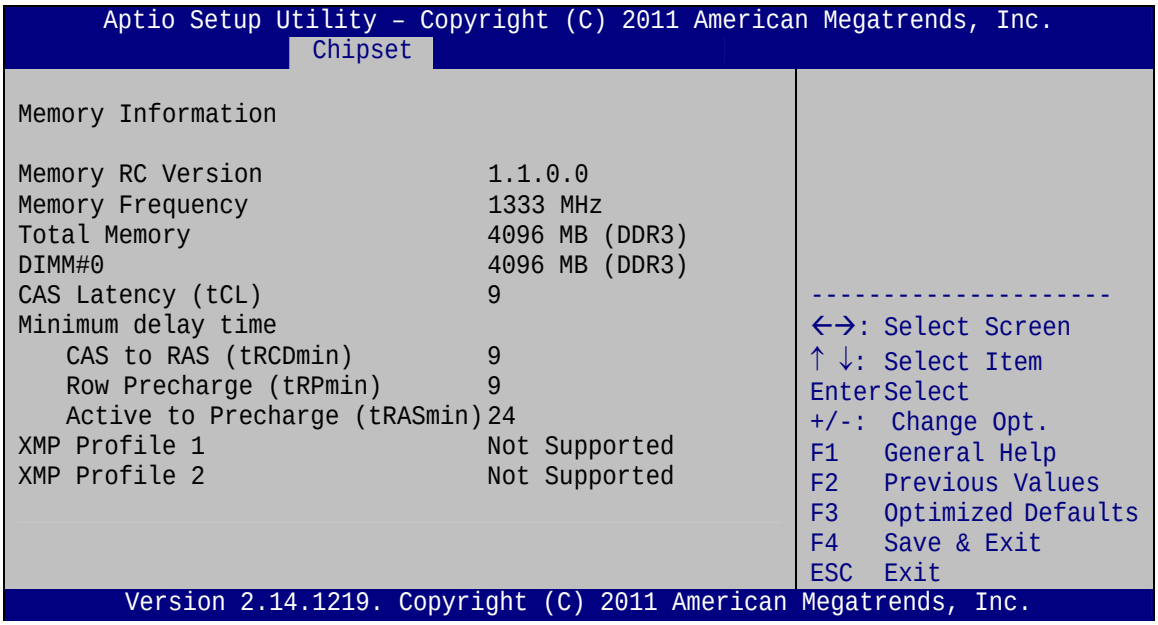
Use the **Backlight Control** option to select the backlight control mode.

➔ **Inverted** **DEFAULT** The LVDS backlight is brighter at high voltage level.

➔ **Normal** The LVDS backlight is brighter at low voltage level.

5.4.2.2 Memory Configuration

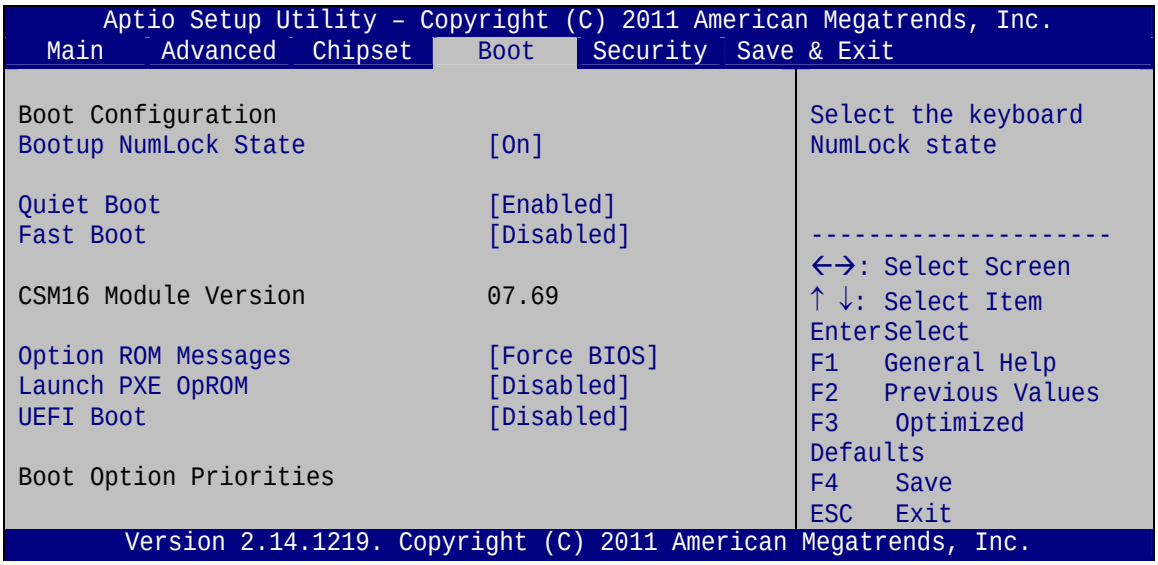
Use the **Memory Configuration** submenu (**BIOS Menu 22**) to view memory information.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Memory Information
Memory RC Version 1.1.0.0
Memory Frequency 1333 MHz
Total Memory 4096 MB (DDR3)
DIMM#0 4096 MB (DDR3)
CAS Latency (tCL) 9
Minimum delay time
CAS to RAS (tRCDmin) 9
Row Precharge (tRPmin) 9
Active to Precharge (tRASmin) 24
XMP Profile 1 Not Supported
XMP Profile 2 Not Supported
←→: Select Screen
↑ ↓: Select Item
EnterSelect
+/-: Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 22: Memory Configuration

5.5 Boot

Use the **Boot** menu (**BIOS Menu 23**) to configure system boot options.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Bootup NumLock State [On]
Quiet Boot [Enabled]
Fast Boot [Disabled]
CSM16 Module Version 07.69
Option ROM Messages [Force BIOS]
Launch PXE OpROM [Disabled]
UEFI Boot [Disabled]
Boot Option Priorities
Select the keyboard NumLock state
←→: Select Screen
↑ ↓: Select Item
EnterSelect
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 23: Boot

➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **Fast Boot [Disabled]**

Use the **Fast Boot** option to enable or disable boot with initialization of a minimal set of devices required to launch active boot option. It has no effect for BBS boot options.

➔ **Disabled**	**DEFAULT**	Disable fast boot.
➔ **Enabled**		Enable fast boot

➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**	**DEFAULT**	Sets display mode to force BIOS.
➔ **Keep Current**		Sets display mode to current.

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**	**DEFAULT**	Ignore all PXE Option ROMs
➔ **Enabled**		Load PXE Option ROMs.

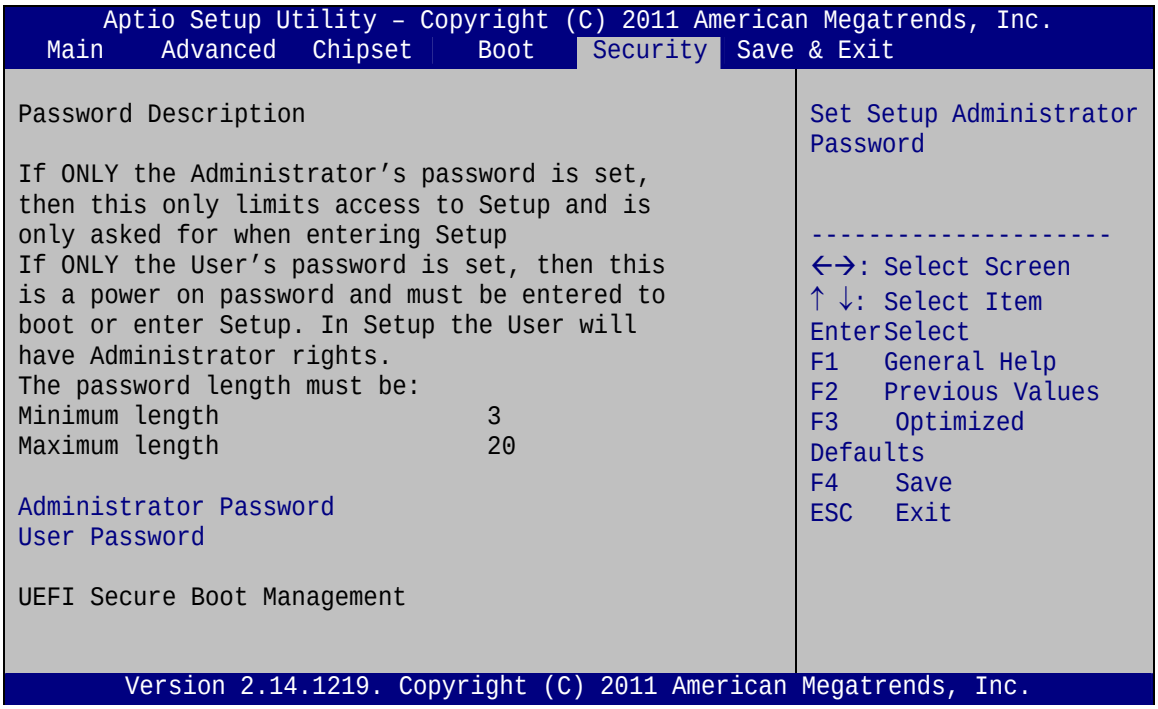
➔ **UEFI Boot [Disabled]**

Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

➔ **Enabled**		Boot from UEFI devices is enabled.
➔ **Disabled**	**DEFAULT**	Boot from UEFI devices is disabled.

5.6 Security

Use the **Security** menu (**BIOS Menu 24**) to set system and user passwords.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be:
Minimum length 3
Maximum length 20
Administrator Password
User Password
UEFI Secure Boot Management
Set Setup Administrator Password
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 24: Security

➔ **Administrator Password**

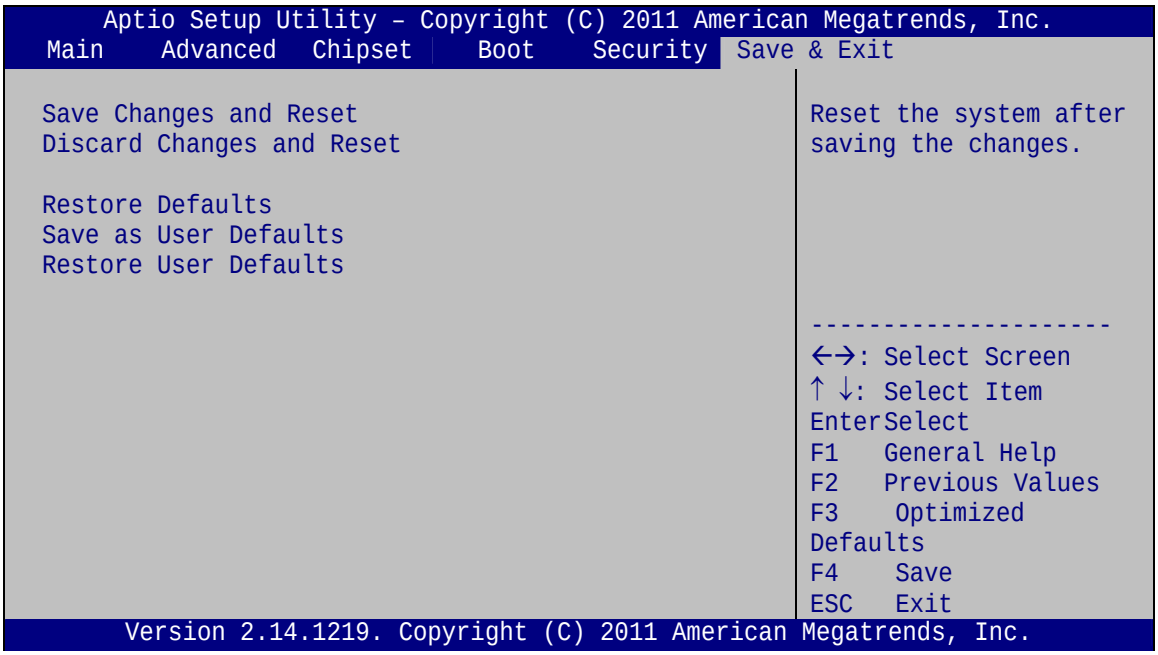
Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 25**) to load default BIOS values, optimal failsafe values and to save configuration changes.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Save as User Defaults
Restore User Defaults
Reset the system after saving the changes.
←→: Select Screen
↑ ↓: Select Item
Enter Select
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save
ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 25:Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN
- Audio
- SATA (Intel® Rapid Storage Technology)
- USB 3.0
- Intel® AMT

Installation instructions are given below.

6.2 Software Installation

All the drivers for the KINO-QM770 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 6-1**).

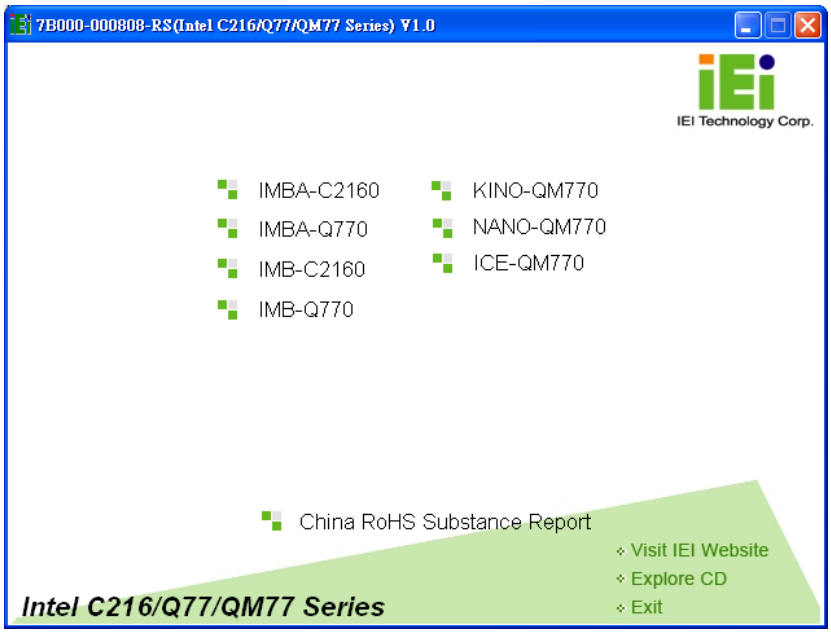


Figure 6-1: Introduction Screen

Step 3: Click KINO-QM770.

Step 4: A new screen with a list of available drivers appears (**Figure 6-2**).

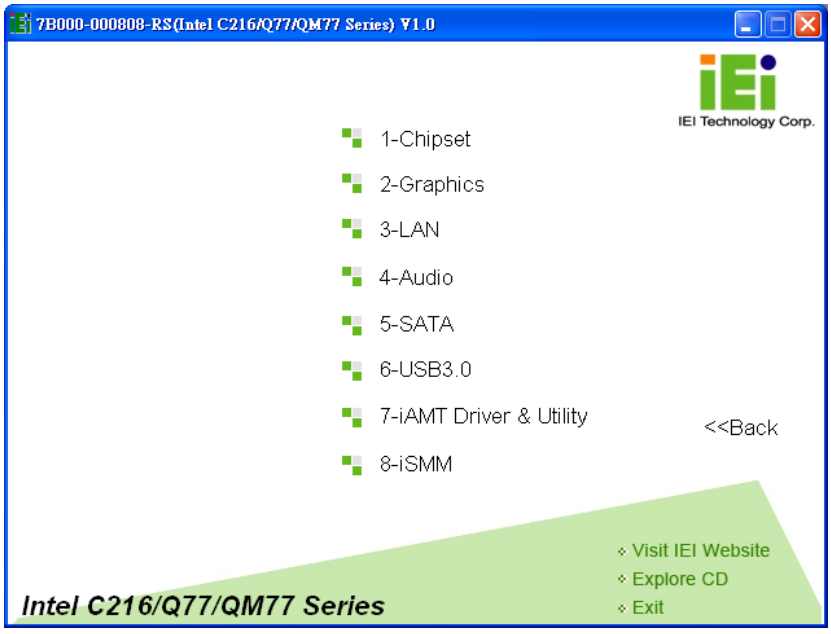


Figure 6-2: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**Chipset**".

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-3** appears.

Step 5: Click **Next** to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
intel
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-3: Chipset Driver Welcome Screen

Step 6: The license agreement in **Figure 6-4** appears.

Step 7: Read the **License Agreement**.

Step 8: Click **Yes** to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

Figure 6-4: Chipset Driver License Agreement

Step 9: The **Read Me** file in **Figure 6-5** appears.

Step 10: Click **Next** to continue.

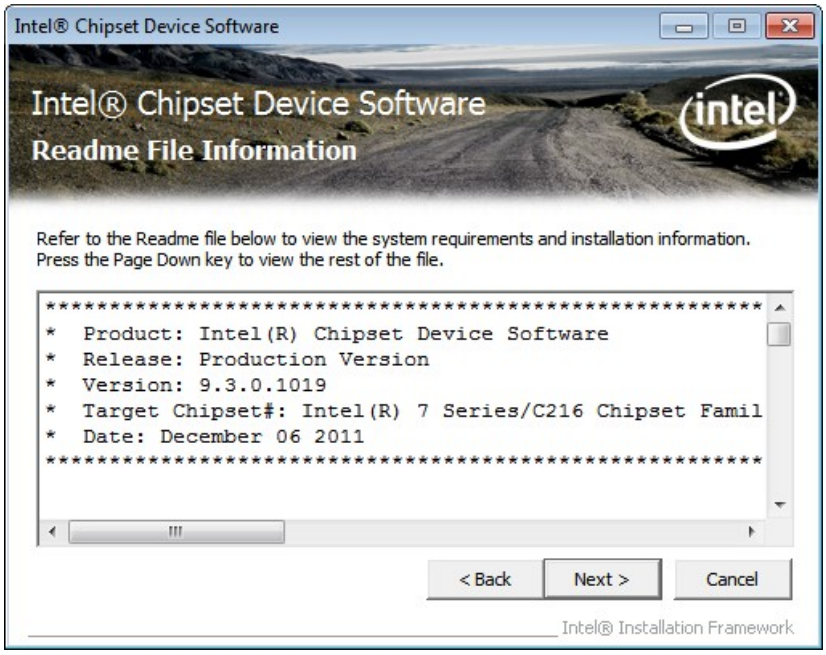

Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
****
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.3.0.1019
* Target Chipset#: Intel(R) 7 Series/C216 Chipset Famil
* Date: December 06 2011
****
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-5: Chipset Driver Read Me File

Step 11: **Setup Operations** are performed as shown in **Figure 6-6**.

Step 12: Once the **Setup Operations** are complete, click **Next** to continue.

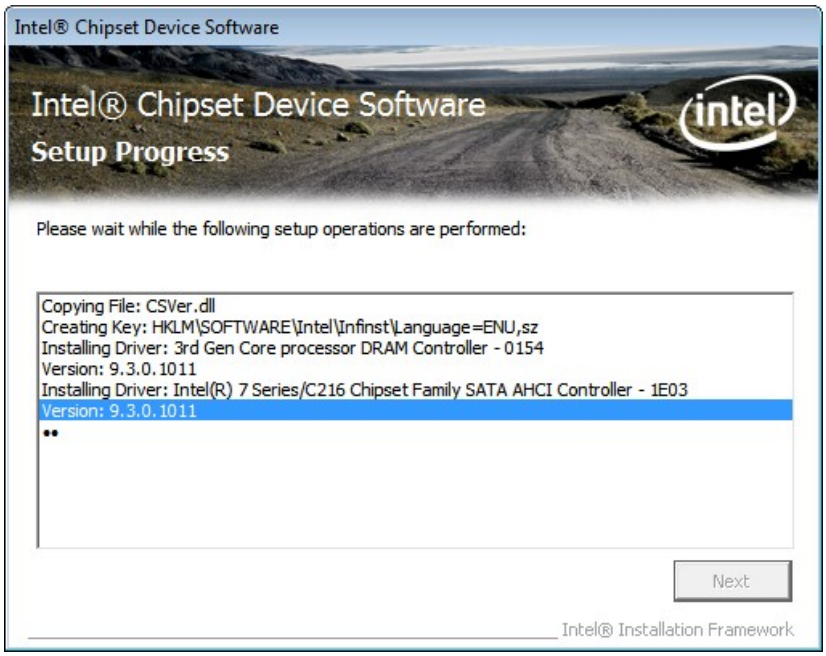

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Progress
intel
Please wait while the following setup operations are performed:
Copying File: CSVer.dll
Creating Key: HKLM\SOFTWARE\Intel\Infinst\Language=ENU,sz
Installing Driver: 3rd Gen Core processor DRAM Controller - 0154
Version: 9.3.0.1011
Installing Driver: Intel(R) 7 Series/C216 Chipset Family SATA AHCI Controller - 1E03
Version: 9.3.0.1011
Next
Intel® Installation Framework

Figure 6-6: Chipset Driver Setup Operations

Step 13: The **Finish** screen in **Figure 6-7** appears.

Step 14: Select "**Yes, I want to restart this computer now**" and click **Finish**.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
intel
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Figure 6-7: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**Graphics**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **Welcome Screen** in **Figure 6-8** appears.

Step 5: Click **Next** to continue.

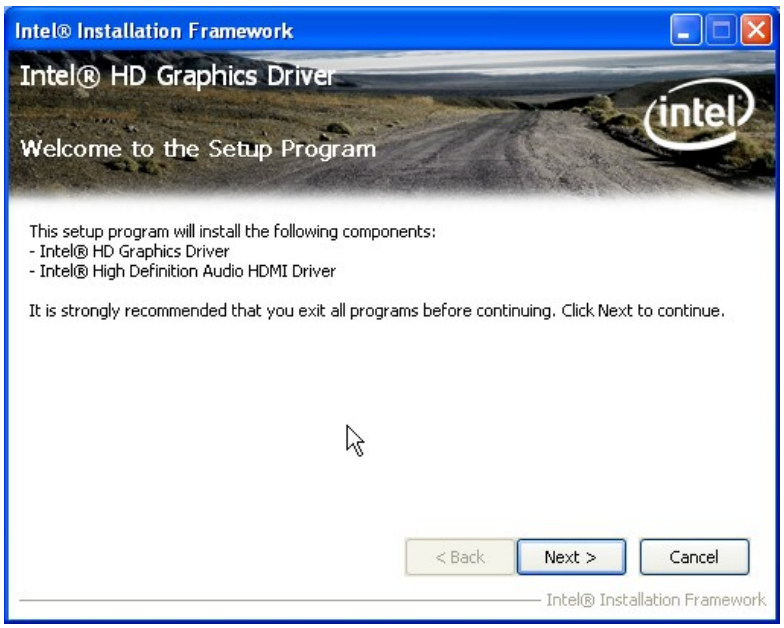

Intel® Installation Framework
Intel® HD Graphics Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
- Intel® HD Graphics Driver
- Intel® High Definition Audio HDMI Driver
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-8: Graphics Driver Welcome Screen

Step 6: The **License Agreement** in **Figure 6-9** appears.

Step 7: Click **Yes** to accept the agreement and continue.

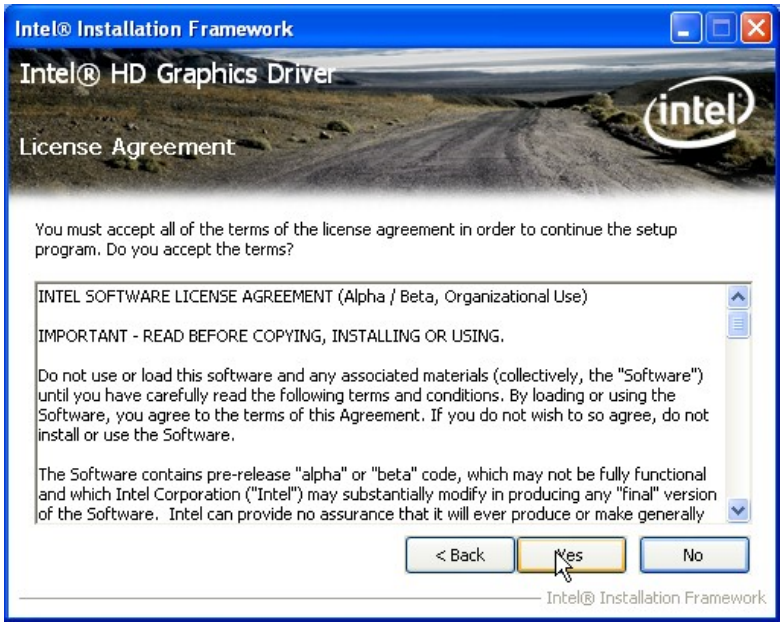

Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
The Software contains pre-release "alpha" or "beta" code, which may not be fully functional and which Intel Corporation ("Intel") may substantially modify in producing any "final" version of the Software. Intel can provide no assurance that it will ever produce or make generally
< Back
Yes
No
Intel® Installation Framework

Figure 6-9: Graphics Driver License Agreement

Step 8: **Setup Operations** are performed as shown in **Figure 6-10**.

Step 9: Once the **Setup Operations** are complete, click **Next** to continue.

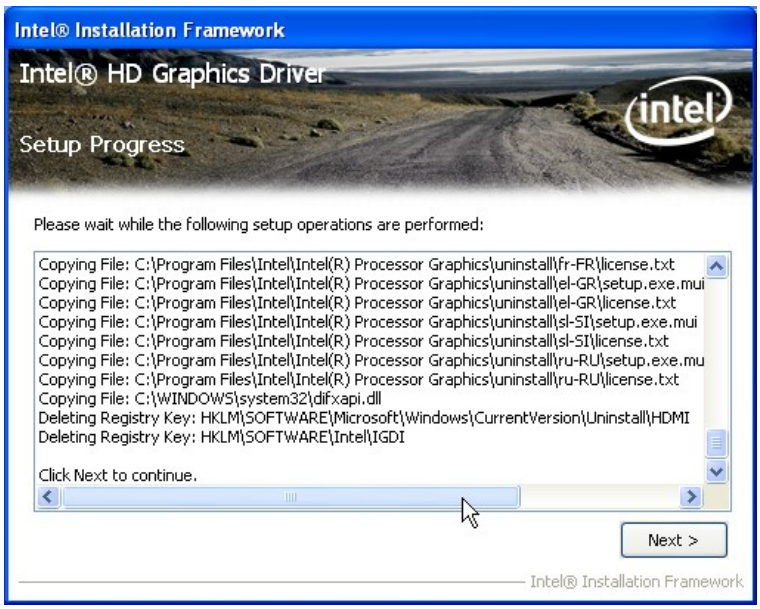

Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\fr-FR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\el-GR\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\el-GR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\sl-SI\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\sl-SI\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\ru-RU\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\ru-RU\license.txt
Copying File: C:\WINDOWS\system32\difxapi.dll
Deleting Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI
Deleting Registry Key: HKLM\SOFTWARE\Intel\IGDI
Click Next to continue.
Next >
Intel® Installation Framework

Figure 6-10: Graphics Driver Setup Operations

Step 10: The **Finish** screen in **Figure 6-11** appears.

Step 11: Select "**Yes, I want to restart this computer now**" and click **Finish**.

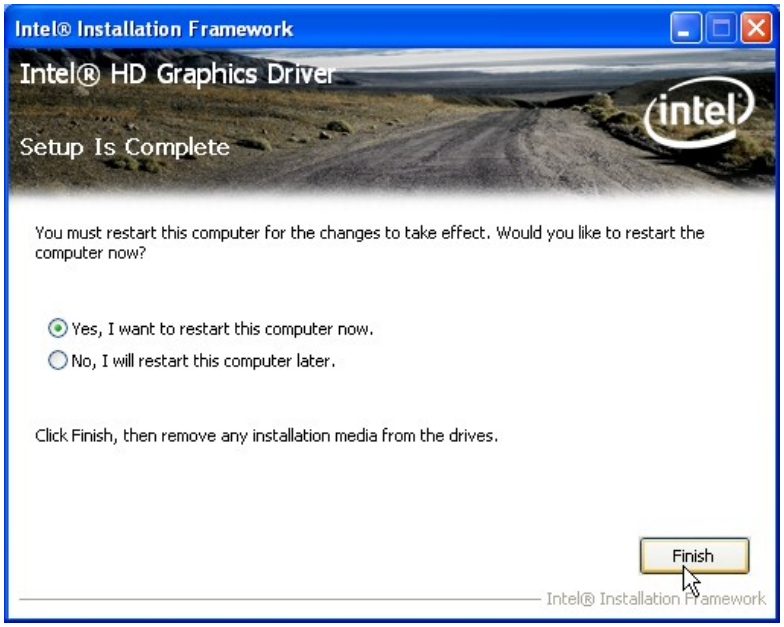

Intel® Installation Framework
Intel® HD Graphics Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Figure 6-11: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

Step 1: Right-click the Computer button from the start menu and select **Properties**. (**Figure 6-12**).

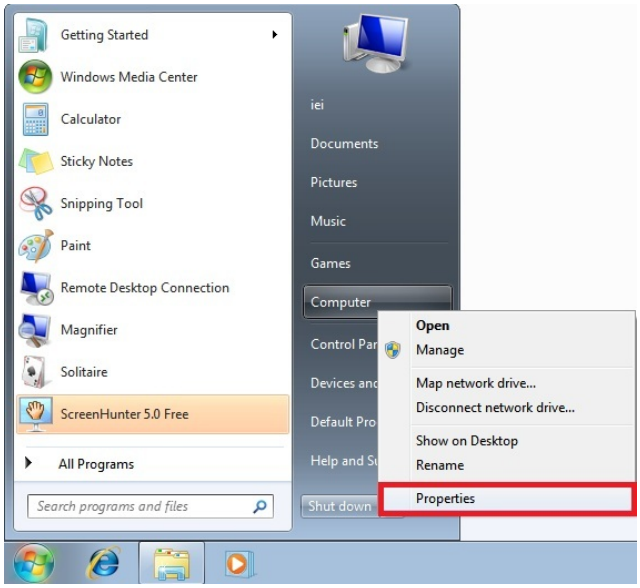


Figure 6-12: Windows Control Panel

Step 2: The system control panel window in **Figure 6-13** appears.

Step 3: Click the Device Manager link (**Figure 6-13**).

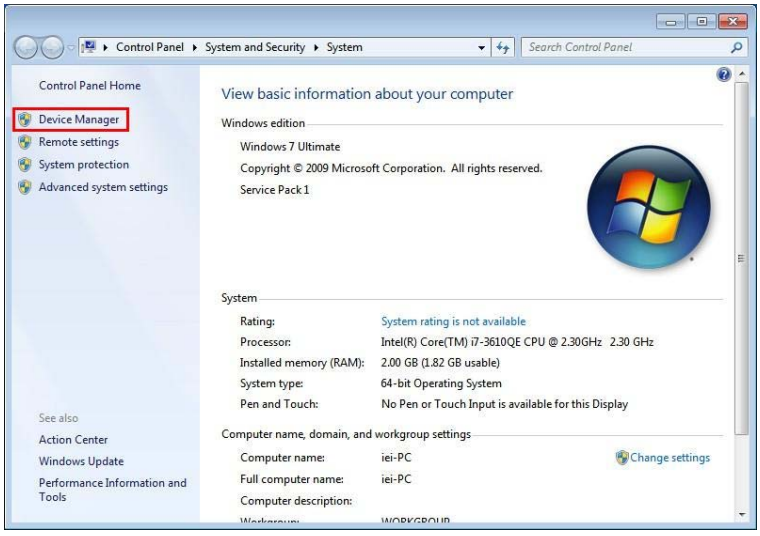


Figure 6-13: System Control Panel

Step 4: A list of system hardware devices appears (**Figure 6-14**).

Step 5: Right-click the Ethernet Controller that has question marks next to it (this means Windows does not recognize the device).

Step 6: Select **Update Driver Software**.

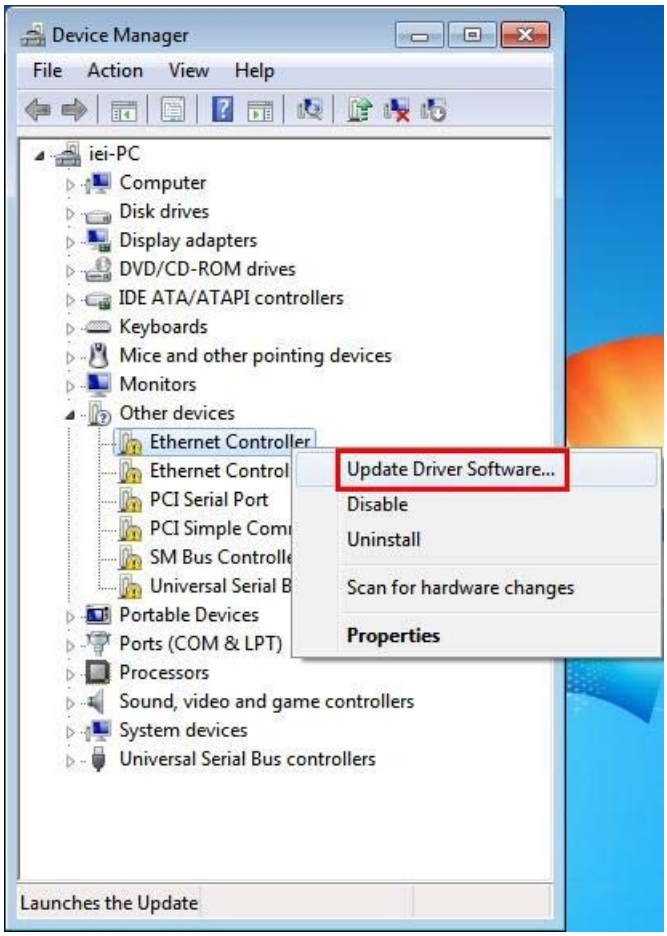


Figure 6-14: Device Manager List

Step 7: The Update Driver Software Window appears (**Figure 6-15**).

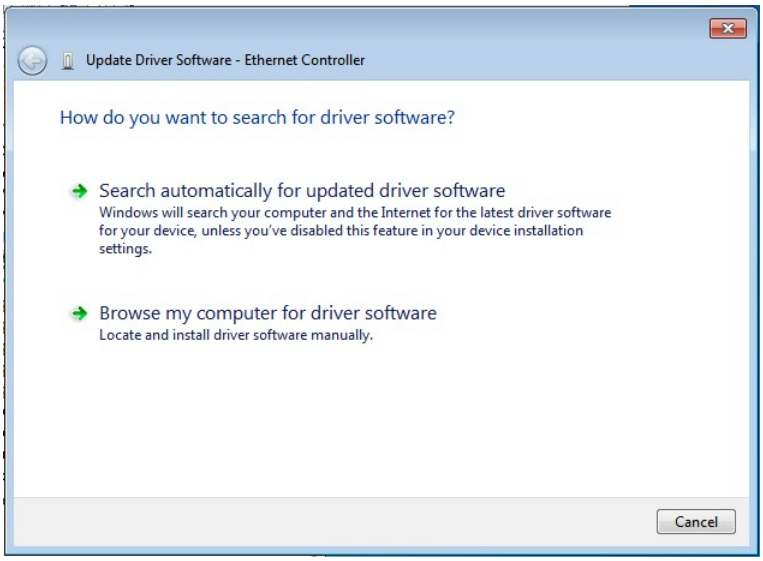

Update Driver Software - Ethernet Controller
How do you want to search for driver software?
Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
Browse my computer for driver software
Locate and install driver software manually.
Cancel

Figure 6-15: Update Driver Software Window

Step 8: Select "Browse my computer for driver software" and click **NEXT** to continue.

Step 9: Click Browse to select "**X:\3-LAN**" directory in the **Locate File** window, where "**X:\"** is the system CD drive. (**Figure 6-16**).

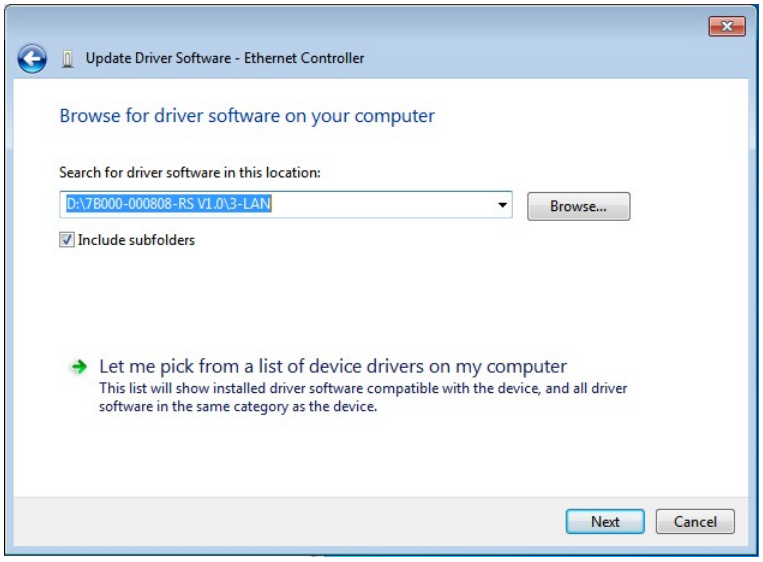

Update Driver Software - Ethernet Controller
Browse for driver software on your computer
Search for driver software in this location:
D:\7B000-000808-RS V1.0\3-LAN
Browse...
Include subfolders
Let me pick from a list of device drivers on my computer
This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
Next
Cancel

Figure 6-16: Locate Driver Files

Step 10: Click **NEXT** to continue.

Step 11: Driver Installation is performed as shown in **Figure 6-17**.

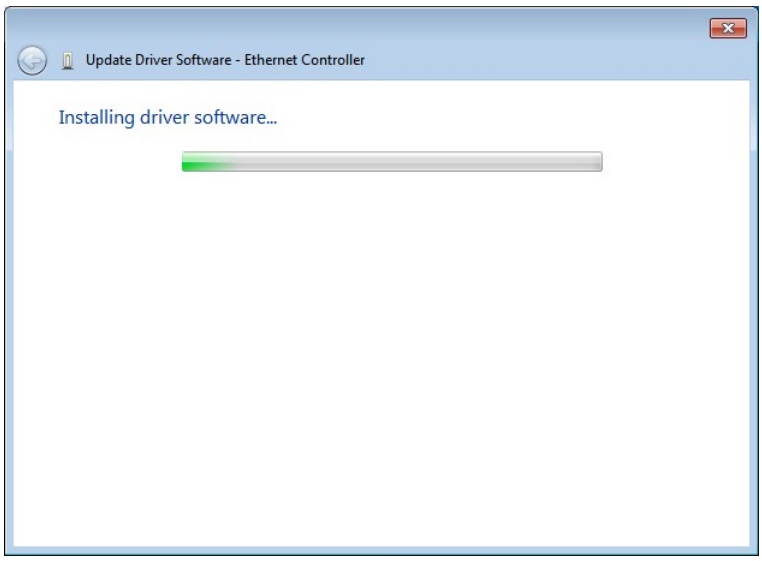


Figure 6-17: LAN Driver Installation

Step 12: The **Finish** screen in **Figure 6-18** appears. Click **Close** to exit.

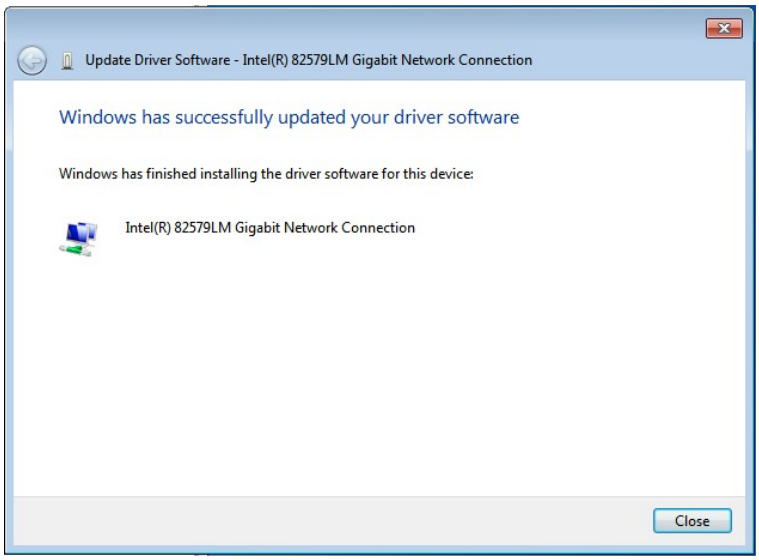

Update Driver Software - Intel(R) 82579LM Gigabit Network Connection
Windows has successfully updated your driver software
Windows has finished installing the driver software for this device:
Intel(R) 82579LM Gigabit Network Connection
Close

Figure 6-18: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the audio driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**Audio**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **InstallShield Wizard** is prepared to guide the user through the rest of the process.

Step 5: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 6-19**).

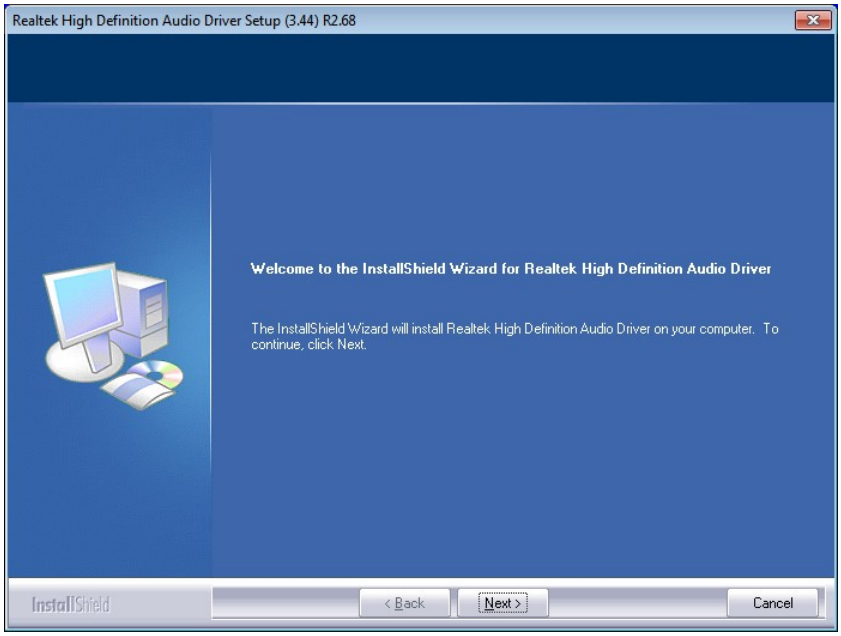

Realtek High Definition Audio Driver Setup (3.44) R2.68
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 6-19: InstallShield Wizard Welcome Screen

Step 6: Click **NEXT** to continue the installation.

Step 7: InstallShield starts to install the new software as shown in **Figure 6-20**.

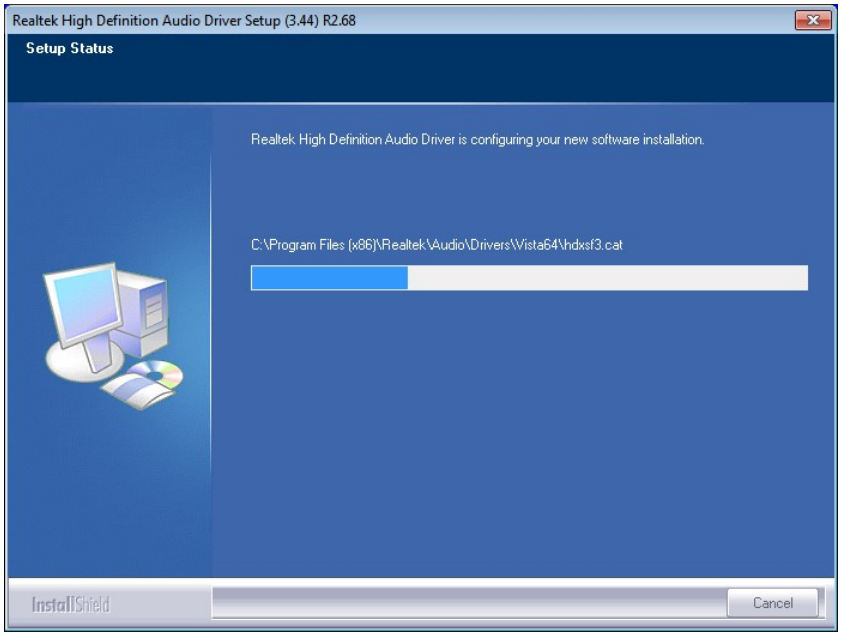

Realtek High Definition Audio Driver Setup (3.44) R2.68
Setup Status
Realtek High Definition Audio Driver is configuring your new software installation.
C:\Program Files (x86)\Realtek\Audio\Drivers\Vista64\hdxsf3.cat
InstallShield
Cancel

Figure 6-20: Audio Driver Software Configuration

Step 8: After the driver installation process is complete, a confirmation screen appears (**Figure 6-21**).

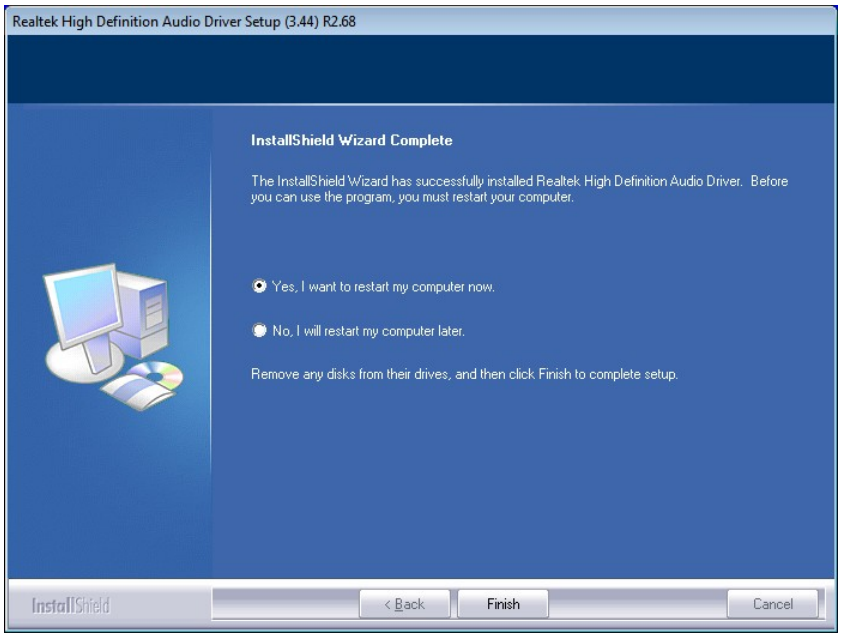

Realtek High Definition Audio Driver Setup (3.44) R2.68
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Realtek High Definition Audio Driver. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 6-21: Restart the Computer

Step 9: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

6.7 Intel® Rapid Storage Technology Driver Installation

To install the Intel® Rapid Storage Technology driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**SATA**".

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-22** appears.

Step 5: Click **Next** to continue.

Intel® Installation Framework
Intel® Rapid Storage Technology
Welcome to the Setup Program
intel
This setup program will install Intel® Rapid Storage Technology onto this computer.
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
Install Intel® Control Center
Intel® Control Center provides a centralized starting point for Intel applications making it easier to find the programs that you need.
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-22: SATA RAID Driver Welcome Screen

Step 6: The license agreement in **Figure 6-23** appears.

Step 7: Read the **License Agreement**.

Step 8: Click **Yes** to continue.

Intel® Installation Framework
Intel® Rapid Storage Technology
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

Figure 6-23: SATA RAID Driver License Agreement

Step 9: The **Read Me** file in **Figure 6-24** appears.

Step 10: Click **Next** to continue.

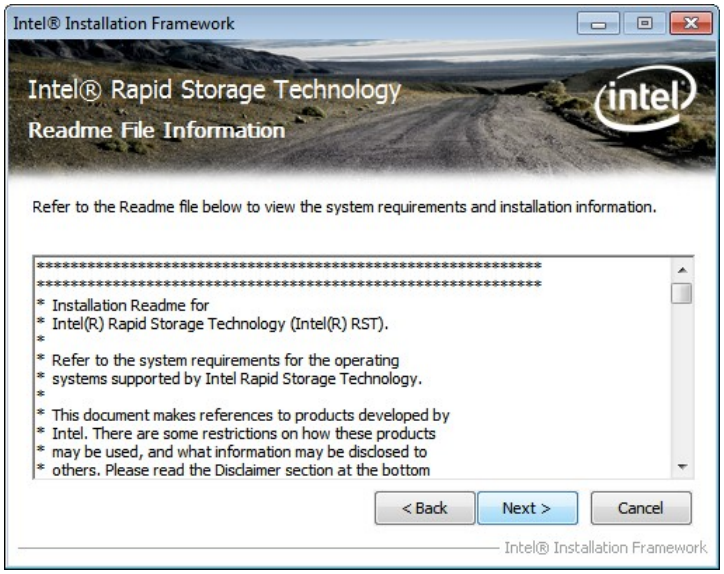

Intel® Installation Framework
Intel® Rapid Storage Technology
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
****
****
* Installation Readme for
* Intel(R) Rapid Storage Technology (Intel(R) RST).
*
* Refer to the system requirements for the operating
* systems supported by Intel Rapid Storage Technology.
*
* This document makes references to products developed by
* Intel. There are some restrictions on how these products
* may be used, and what information may be disclosed to
* others. Please read the Disclaimer section at the bottom
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-24: SATA RAID Driver Read Me File

Step 11: **Setup Operations** are performed as shown in **Figure 6-25**.

Step 12: Once the **Setup Operations** are complete, click **Next** to continue.

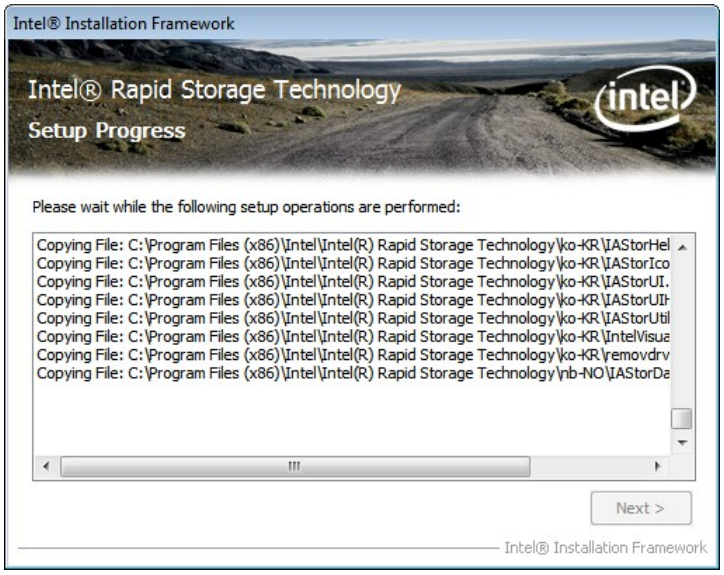

Intel® Installation Framework
Intel® Rapid Storage Technology
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IAStorHel
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IAStorIco
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IAStorUI.
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IAStorUIH
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IAStorUtil
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\IntelVisua
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\ko-KR\removdrv
Copying File: C:\Program Files (x86)\Intel\Intel(R) Rapid Storage Technology\nb-NO\IAStorDa
Next >
Intel® Installation Framework

Figure 6-25: SATA RAID Driver Setup Operations

Step 13: The **Finish** screen in **Figure 6-26** appears.

Step 14: Select "**Yes, I want to restart this computer now**" and click **Finish**.

Intel® Installation Framework
Intel® Rapid Storage Technology
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Figure 6-26: SATA RAID Driver Installation Finish Screen

6.8 USB 3.0 Driver Installation

WARNING:

Do not run this driver's installer (Setup.exe) from a USB storage device (ie. external USB hard drive or USB thumb drive). For proper installation, please copy driver files to a local hard drive folder and run from there.

To install the touch panel software driver, please follow the steps below.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**USB 3.0**".

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-27** appears.

Step 5: Click **Next** to continue.

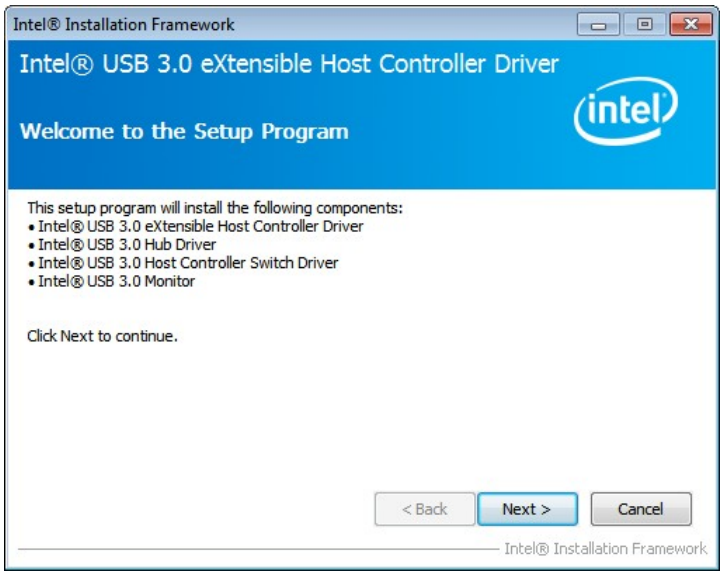

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
• Intel® USB 3.0 eXtensible Host Controller Driver
• Intel® USB 3.0 Hub Driver
• Intel® USB 3.0 Host Controller Switch Driver
• Intel® USB 3.0 Monitor
Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-27: USB 3.0 Driver Welcome Screen

Step 6: The license agreement in **Figure 6-28** appears.

Step 7: Read the **License Agreement**.

Step 8: Click **Yes** to continue.

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

Figure 6-28: USB 3.0 Driver License Agreement

Step 9: The **Read Me** file in **Figure 6-29** appears.

Step 10: Click **Next** to continue.

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
***** WARNING *****
Do not run this driver's installer (Setup.exe) from a USB storage device (ie. external USB hard drive or USB thumb drive). For proper installation, please copy driver files to a local hard drive folder and run from there.
****
*
* Production Version Releases
*
* Microsoft Windows* 7
*
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-29: USB 3.0 Driver Read Me File

Step 11: **Setup Operations** are performed as shown in **Figure 6-30**.

Step 12: Once the **Setup Operations** are complete, click **Next** to continue.

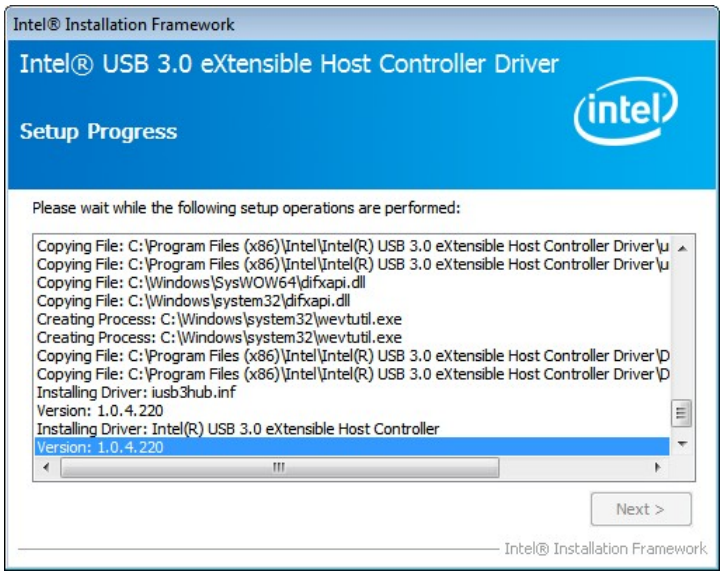

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Controller Driver\u
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Controller Driver\u
Copying File: C:\Windows\SysWOW64\difxapi.dll
Copying File: C:\Windows\system32\difxapi.dll
Creating Process: C:\Windows\system32\wevtutil.exe
Creating Process: C:\Windows\system32\wevtutil.exe
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Controller Driver\D
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Controller Driver\D
Installing Driver: iusb3hub.inf
Version: 1.0.4.220
Installing Driver: Intel(R) USB 3.0 eXtensible Host Controller
Version: 1.0.4.220
Next >
Intel® Installation Framework

Figure 6-30: USB 3.0 Driver Setup Operations

Step 13: The **Finish** screen in **Figure 6-31** appears.

Step 14: Select "**Yes, I want to restart this computer now**" and click **Finish**.

Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Figure 6-31: USB 3.0 Driver Installation Finish Screen

6.9 Intel® AMT Driver Installation

The package of the Intel® AMT components includes

- Intel® Management Engine Interface (Intel® ME Interface)
- Intel® Dynamic Application Loader
- Intel® Identity Protection Technology (Intel® IPT)
- Serial Over LAN (SOL)
- Intel® Manageability Engine Firmware Recovery Agent
- Intel® Management and Security Status
- Local Management Service (LMS)
- User Notification Service (UNS)

To install these Intel® AMT components, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**iAMT**".

Step 3: Locate the setup file and double click it.

Step 4: When the setup files are completely extracted the **Welcome Screen** in **Figure 6-32** appears.

Step 5: Click **Next** to continue.

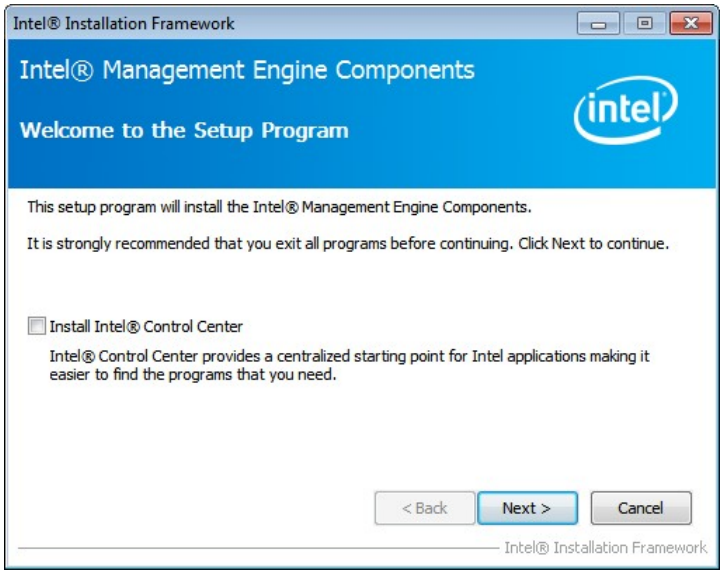

Intel® Installation Framework
Intel® Management Engine Components
Welcome to the Setup Program
This setup program will install the Intel® Management Engine Components.
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
Install Intel® Control Center
Intel® Control Center provides a centralized starting point for Intel applications making it easier to find the programs that you need.
< Back
Next >
Cancel
Intel® Installation Framework

Figure 6-32: Intel® ME Driver Welcome Screen

Step 6: The license agreement in **Figure 6-33** appears.

Step 7: Read the **License Agreement**.

Step 8: Click **Yes** to continue.

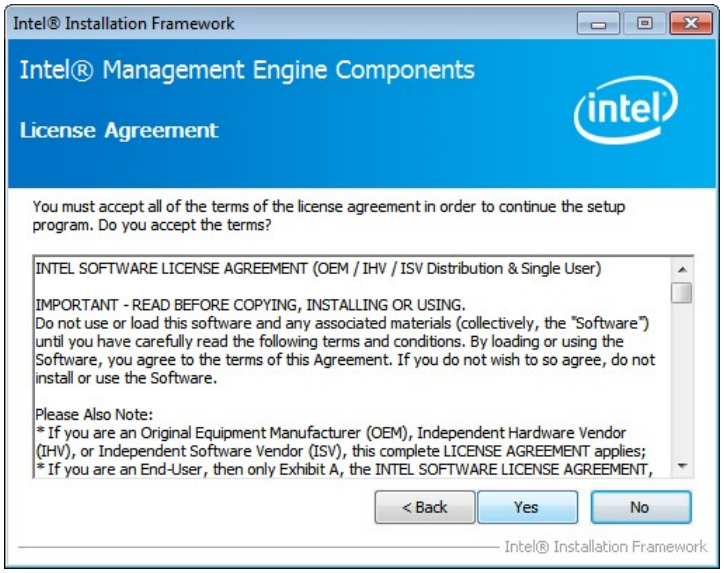

Intel® Installation Framework
Intel® Management Engine Components
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

Figure 6-33: Intel® ME Driver License Agreement

Step 9: **Setup Operations** are performed as shown in **Figure 6-34**.

Step 10: Once the **Setup Operations** are complete, click **Next** to continue.

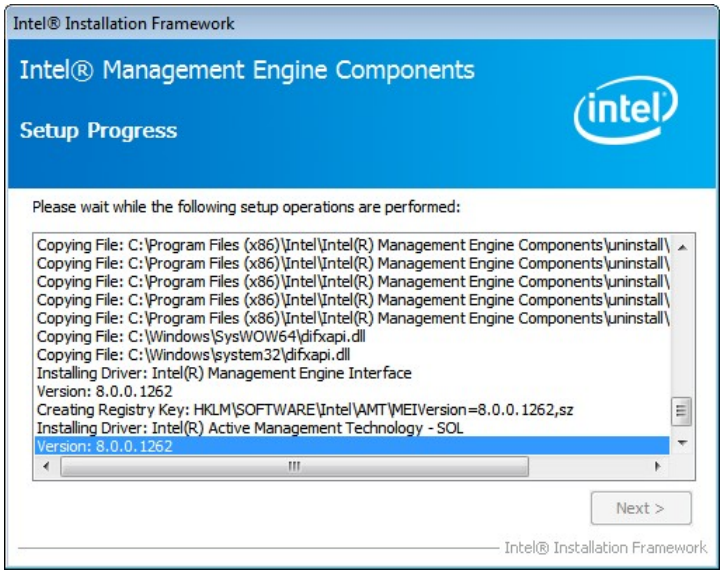

Intel® Installation Framework
Intel® Management Engine Components
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\uninstall\
Copying File: C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\uninstall\
Copying File: C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\uninstall\
Copying File: C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\uninstall\
Copying File: C:\Program Files (x86)\Intel\Intel(R) Management Engine Components\uninstall\
Copying File: C:\Windows\SysWOW64\difxapi.dll
Copying File: C:\Windows\system32\difxapi.dll
Installing Driver: Intel(R) Management Engine Interface
Version: 8.0.0.1262
Creating Registry Key: HKLM\SOFTWARE\Intel\AMT\MEIVersion=8.0.0.1262,sz
Installing Driver: Intel(R) Active Management Technology - SOL
Version: 8.0.0.1262
Next >
Intel® Installation Framework

Figure 6-34: Intel® ME Driver Setup Operations

Step 11: The **Finish** screen in **Figure 6-35** appears.

Step 12: Select "**Yes, I want to restart this computer now**" and click **Finish**.

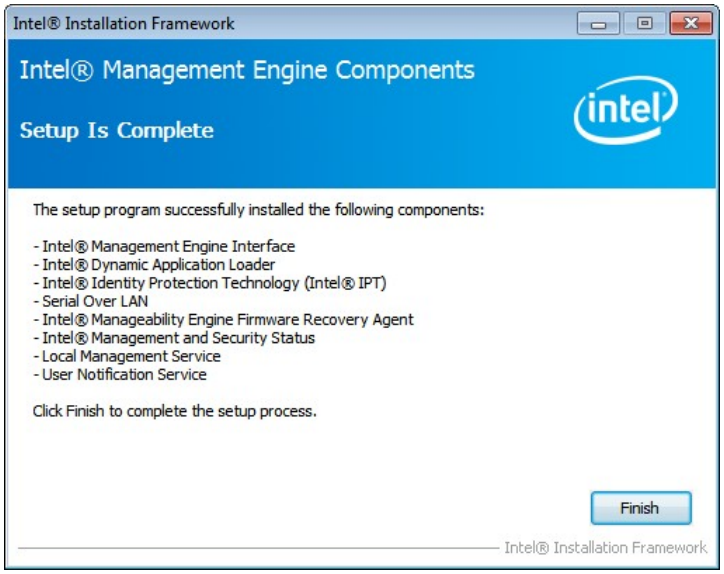

Intel® Installation Framework
Intel® Management Engine Components
Setup Is Complete
The setup program successfully installed the following components:
- Intel® Management Engine Interface
- Intel® Dynamic Application Loader
- Intel® Identity Protection Technology (Intel® IPT)
- Serial Over LAN
- Intel® Manageability Engine Firmware Recovery Agent
- Intel® Management and Security Status
- Local Management Service
- User Notification Service
Click Finish to complete the setup process.
Finish
Intel® Installation Framework

Figure 6-35: Intel® ME Driver Installation Finish Screen

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

BIOS Information 82
System Date [xx/xx/xx] 82
System Time [xx:xx:xx] 83
ACPI Sleep State [S1 only (CPU Stop Clock)] 84
Wake System with Fixed Time [Disabled] 85
Security Device Support [Disable] 87
Hyper Threading [Enabled] 88
Intel Virtualization Technology [Disabled] 88
SATA Mode Selection [AHCI] 89
Hot Plug [Disabled] 89
Intel(R) Rapid Start Technology [Disabled] 90
Intel AMT [Enabled] 92
Un-Configure ME [Disabled] 92
USB Devices 93
Legacy USB Support [Enabled] 93
Serial Port [Enabled] 94
Change Settings [Auto] 94
Serial Port [Enabled] 95
Change Settings [Auto] 95
Serial Port [Enabled] 96
Change Settings [Auto] 96
PC Health Status 97
CPU Fan Smart Fan Control [Auto Mode] 98
SYS Fan Smart Fan Control [Auto Duty-Cycle Mode] 99
Fan start/off temperature 99
Fan start PWM 99
Fan slope PWM 99
Temperature n 99
Console Redirection [Disabled] 100
Auto Recovery Function [Disabled] 101
Azalia [Auto] 103
Azalia internal HDMI codec [Enabled] 103
Power Saving Function [Disabled] 104

VT-d [Enabled] 105
Primary Display [IGFX] 105
PEG0 – Gen X [Gen1] 106
DVMT Pre-Allocated [128MB] 106
DVMT Total Gfx Mem [MAX] 106
Primary IGFX Boot Display [VBIOS Default] 106
LCD Panel Type [By Hardware] 107
Backlight Control [Inverted] 107
Bootup NumLock State [On] 109
Quiet Boot [Enabled] 109
Fast Boot [Disabled] 109
Option ROM Messages [Force BIOS] 110
Launch PXE OpROM [Disabled] 110
UEFI Boot [Disabled] 110
Administrator Password 111
User Password 111
Save Changes and Reset 112
Discard Changes and Reset 112
Restore Defaults 112
Save as User Defaults 112
Restore User Defaults 112

Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.

NOTE:

The latest One Key Recovery software provides an auto recovery function that allows a system running Microsoft Windows OS to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. Please refer to Section B.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

Figure B-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure B-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section B.2.1**)
2. Create partitions (see **Section B.2.2**)
3. Install operating system, drivers and system applications (see **Section B.2.3**)
4. Build the recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section B.5**.

NOTE:

The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the

partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating systems (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows 2000
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
  - Windows Embedded Standard 7

NOTE:

The auto recovery function (described in Section B.3) and the restore through LAN function (described in Section B.6) are not supported in the Windows CE 5.0/6.0 operating system environment.

- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)
  - Ubuntu 8.10 (Intrepid)
  - Ubuntu 7.10 (Gutsy)
  - Ubuntu 6.10 (Edgy)
  - Debian 5.0 (Lenny)
  - Debian 4.0 (Etch)
  - SuSe 11.2
  - SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section B.2.1**)

Step 2: Create partitions (see **Section B.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section B.2.3**)

Step 4: Build the recovery partition (see **Section B.2.4**) or build the auto recovery partition (see **Section B.3**)

Step 5: Create factory default image (see **Section B.2.5**)

The detailed descriptions are described in the following sections.

NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux, most of the setup procedures are the same except for several steps described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

Step 1: Make sure the system is powered off and unplugged.

Step 2: Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3: Connect an optical disk drive to the system and insert the recovery CD.

Step 4: Turn on the system.

Step 5: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6: Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7: Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1: Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

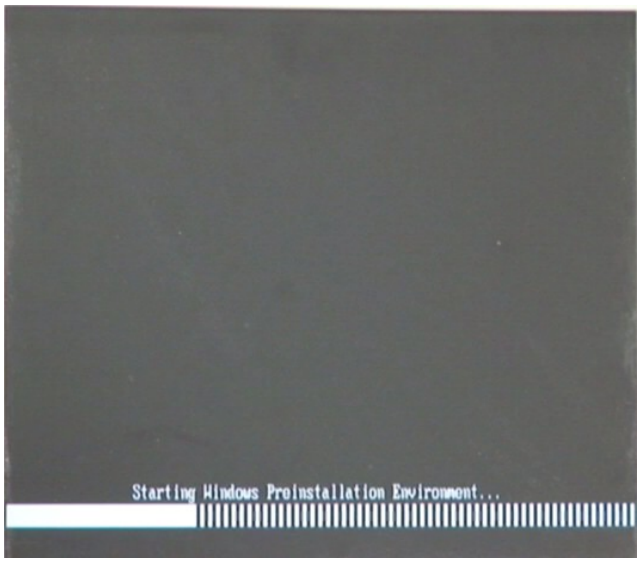


Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

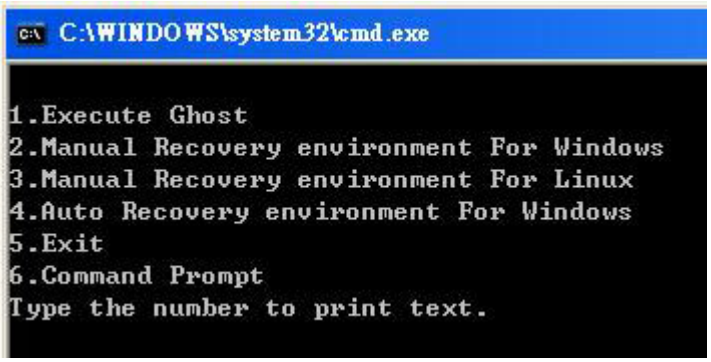


Figure B-3: Recovery Tool Setup Menu

Step 4: Press <**6**> then <Enter>.

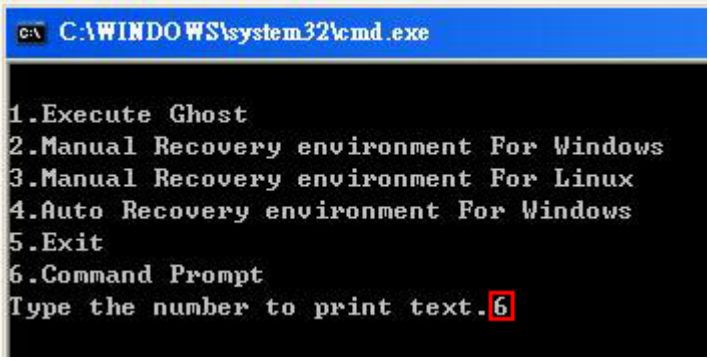


Figure B-4: Command Prompt

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

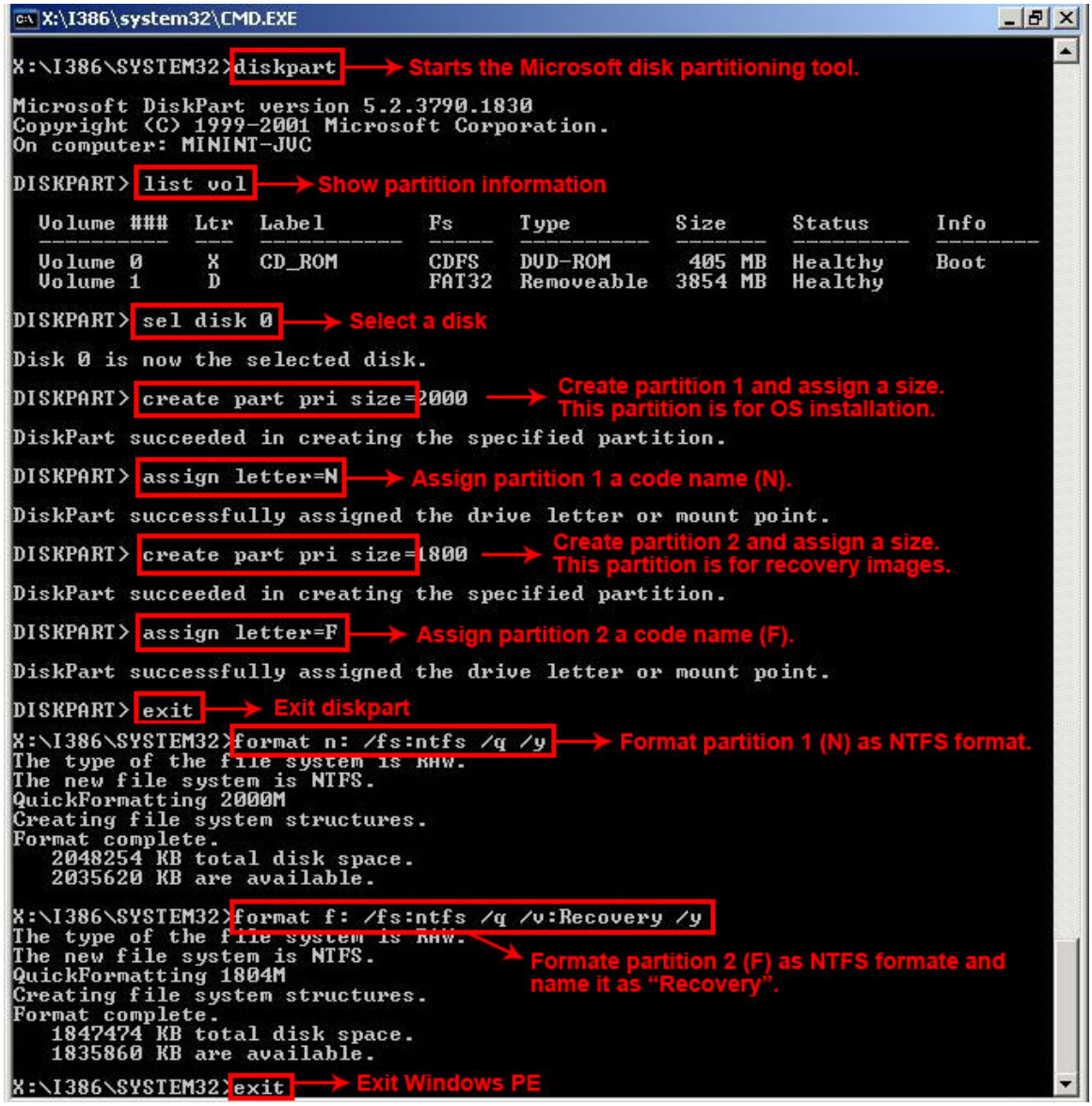
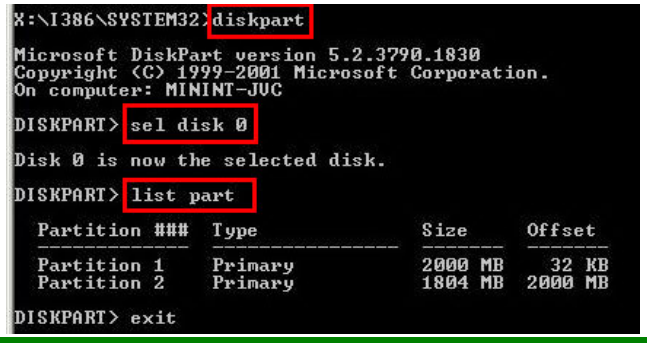

X:\I386\system32\CMD.EXE
X:\I386\SYSTEM32>diskpart
Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> list vol
Show partition information
Volume ### Ltr Label Fs Type Size Status Info
Volume 0 X CD_ROM CDFS DVD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0
Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000
Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N
Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800
Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F
Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit
Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y
Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.
Formate partition 2 (F) as NTFS formate and
name it as “Recovery”.
X:\I386\SYSTEM32>exit
Exit Windows PE

Figure B-5: Partition Creation Commands

NOTE:

Use the following commands to check if the partitions were created successfully.


X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
Partition ### Type Size Offset
Partition 1 Primary 2000 MB 32 KB
Partition 2 Primary 1804 MB 2000 MB
DISKPART> exit

Step 6: Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build the Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Building the Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from the recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

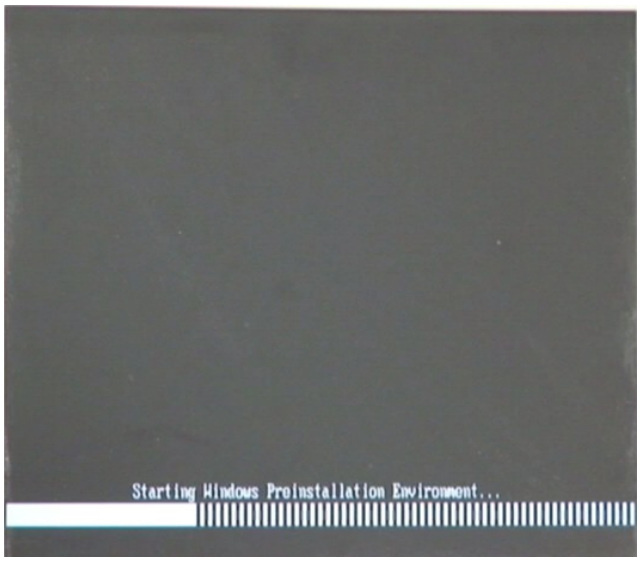


Figure B-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

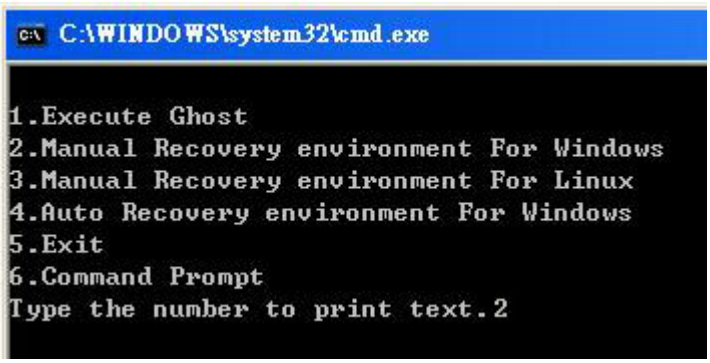


Figure B-7: Manual Recovery Environment for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.

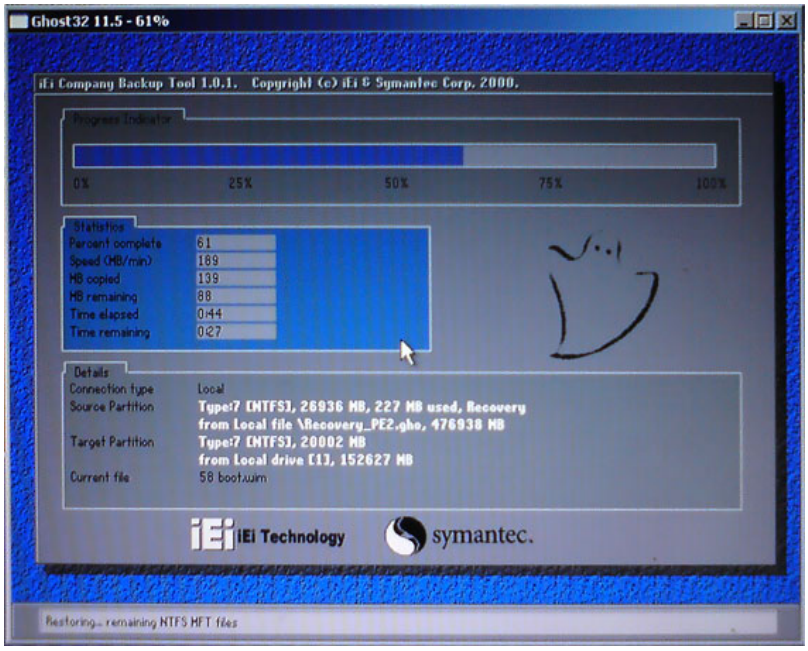


Figure B-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

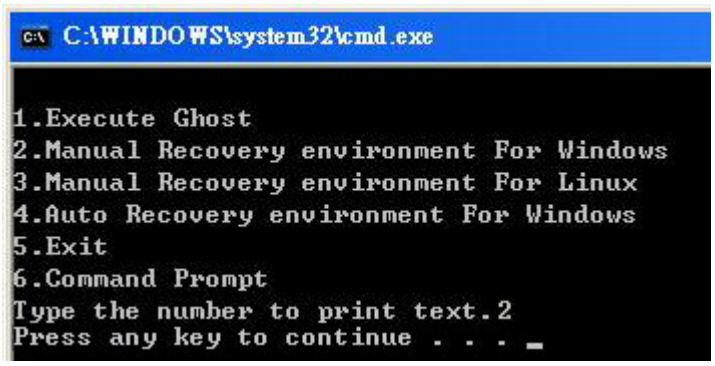


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

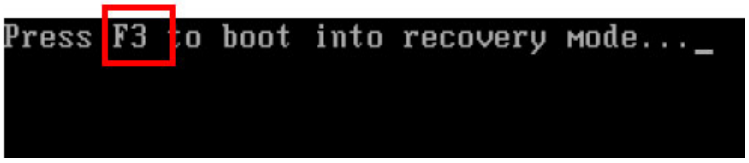


Figure B-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure B-11**)

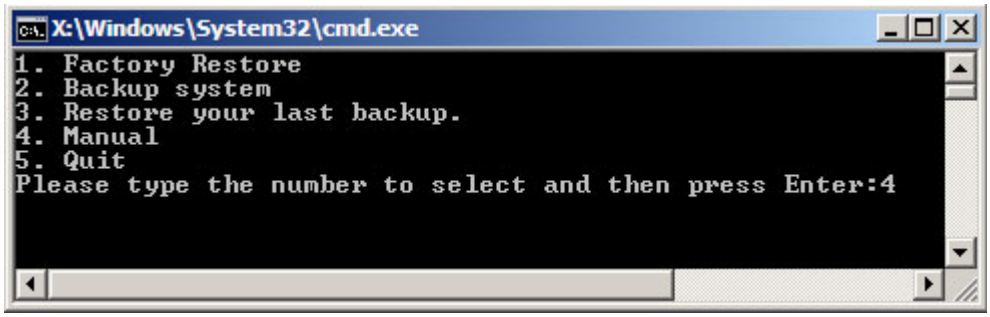


Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

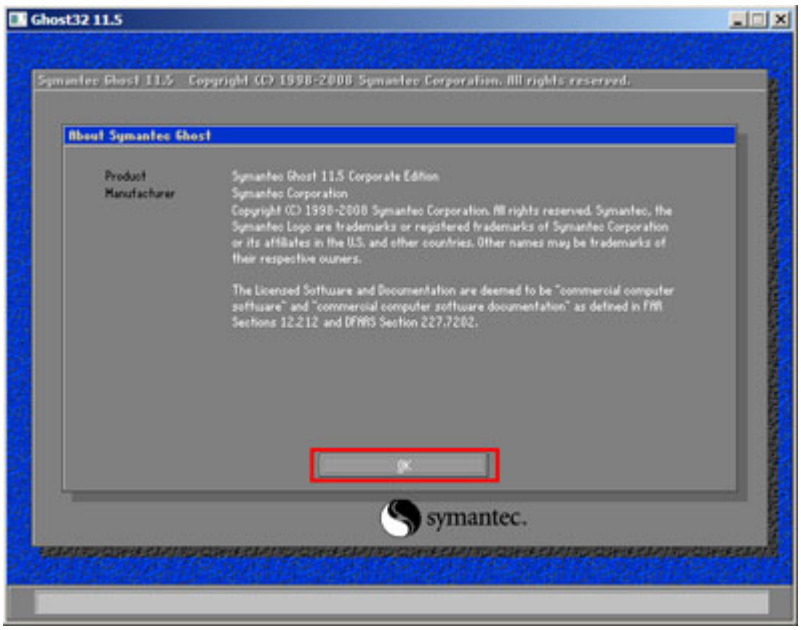


Figure B-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure B-13**).

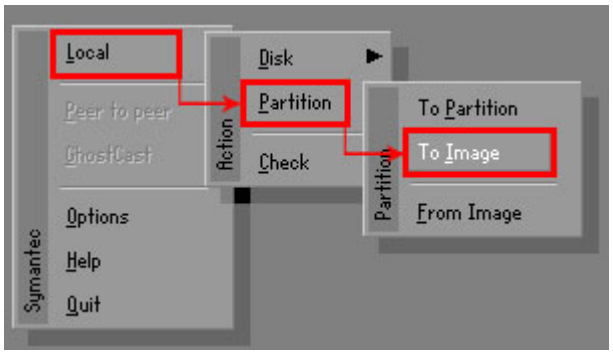


Figure B-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure B-14**. Then click OK.

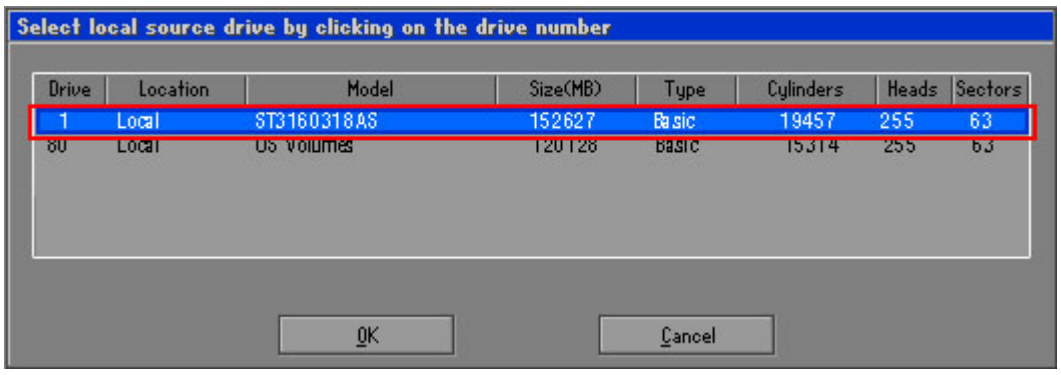


Figure B-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure B-15**. Then click OK.

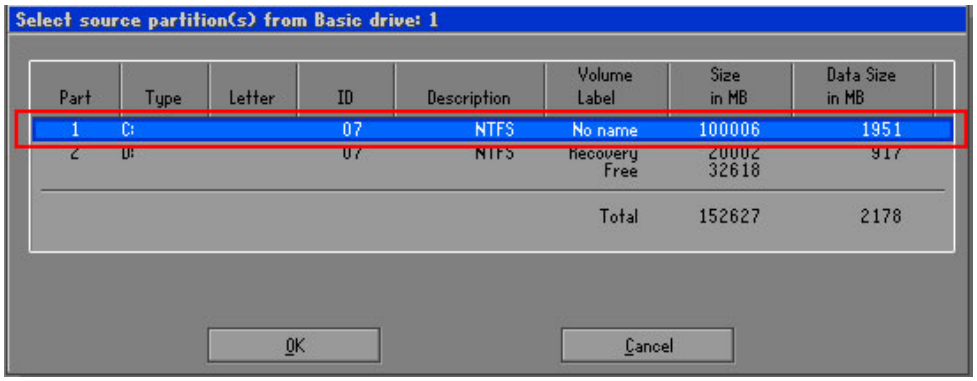


Figure B-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure B-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.

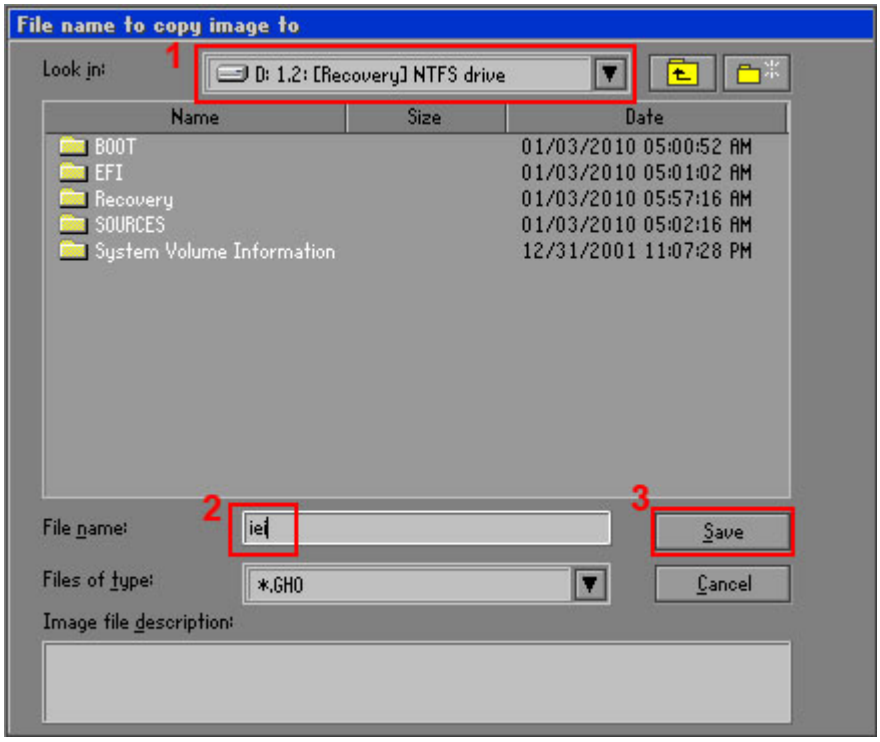


Figure B-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure B-17** prompts, click **High** to make the image file smaller.

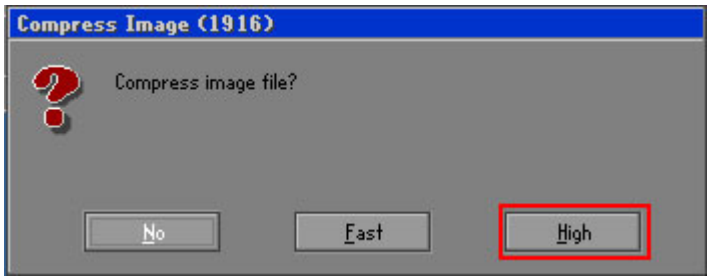


Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

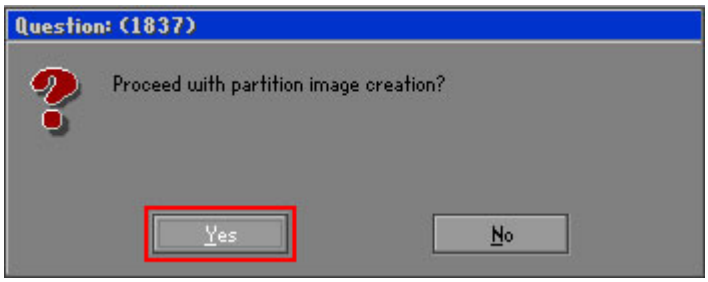


Figure B-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-19**).

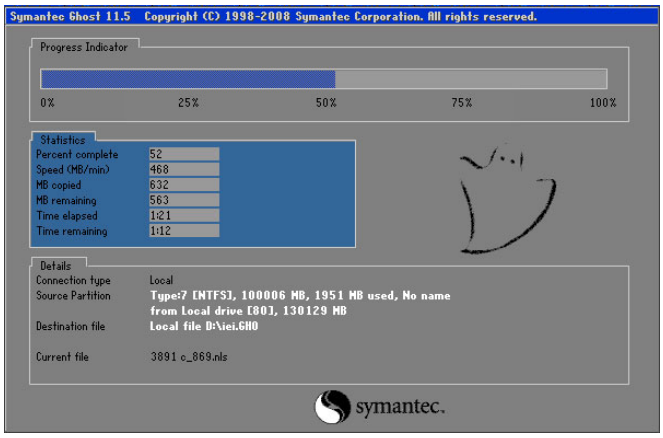


Figure B-19: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**. Click **Continue** and close the Ghost window to exit the program.

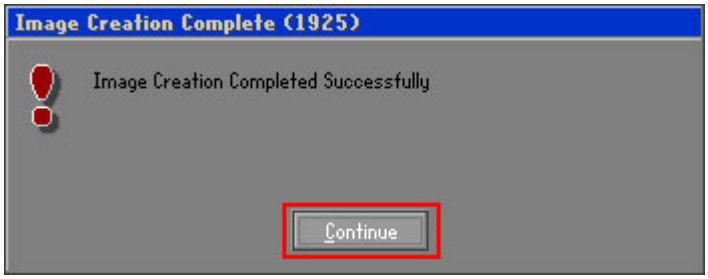


Figure B-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

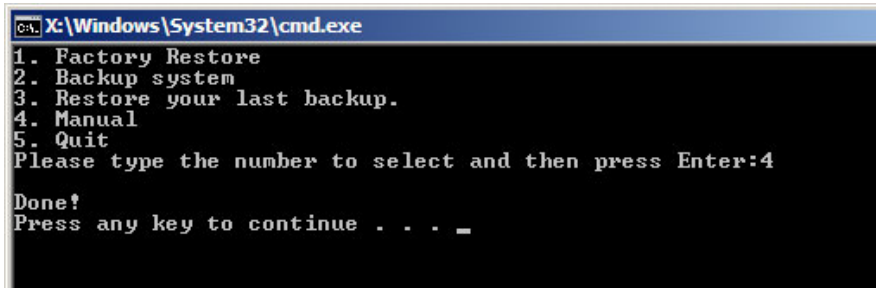


Figure B-21: Press Any Key to Continue

B.3 Auto Recovery Setup Procedure

The auto recovery function allows a system to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To use the auto recovery function, follow the steps described in the following sections.

CAUTION:

The auto recovery function can only run on a Microsoft Windows system with the following OS versions:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

CAUTION:

The setup procedure may include a step to create a factory default image. It is suggested to configure the system to a factory default environment before the configuration, including driver and application installations.

Step 1: Follow the steps described in **Section B.2.1 ~ Section B.2.3** to setup BIOS, create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

Figure B-22: Auto Recovery Utility

Step 3: **Disable the automatically restart function before creating the factory default image**. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See Figure B-23)

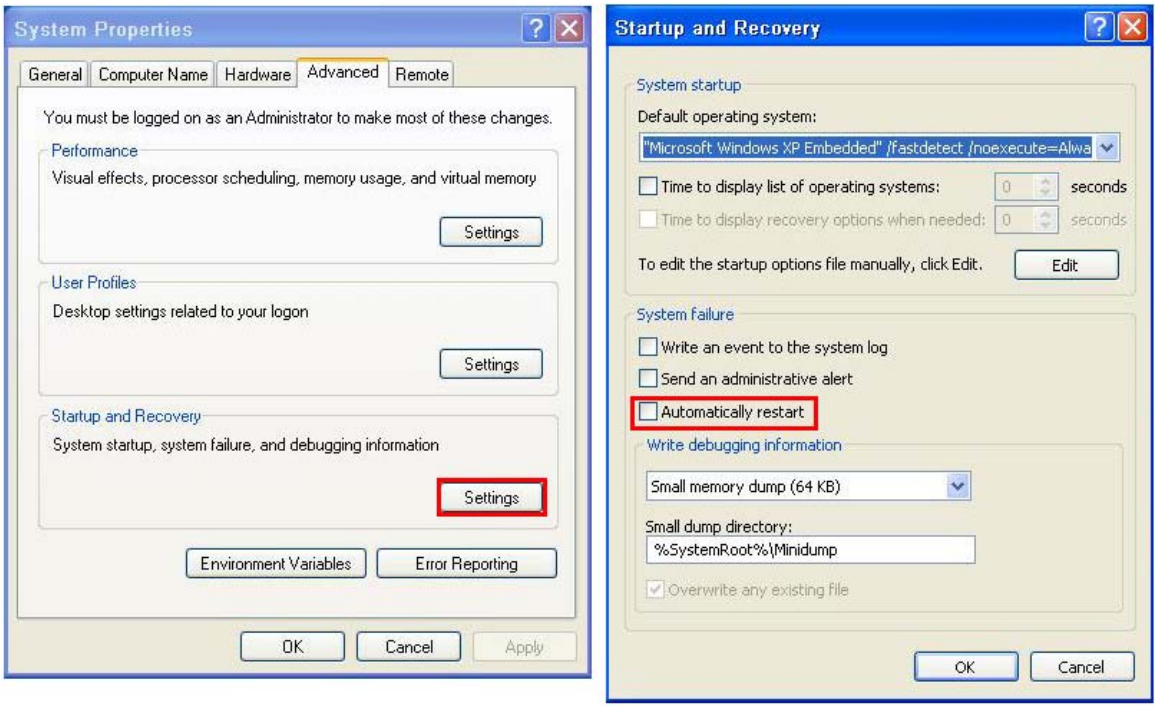


Figure B-23: Disable Automatically Restart

Step 4: Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

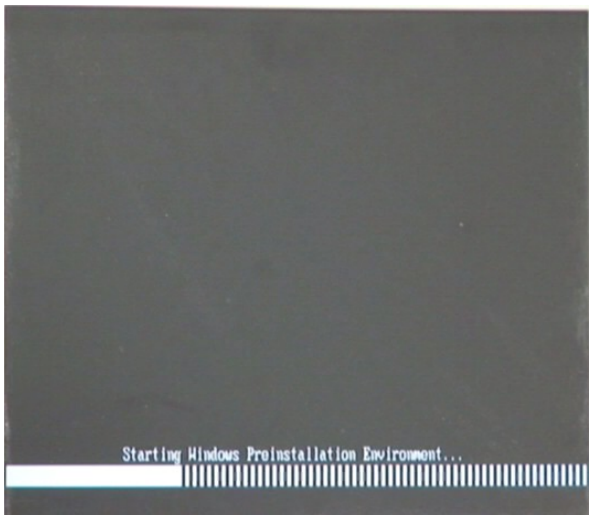


Figure B-24: Launching the Recovery Tool

Step 5: When the recovery tool setup menu appears, press <**4**> then <Enter>.

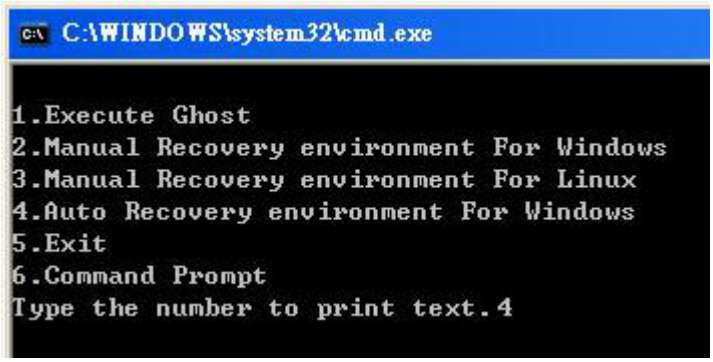


Figure B-25: Auto Recovery Environment for Windows

Step 6: The Symantec Ghost window appears and starts configuring the system to build an auto recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the auto recovery tool is saved in this partition.

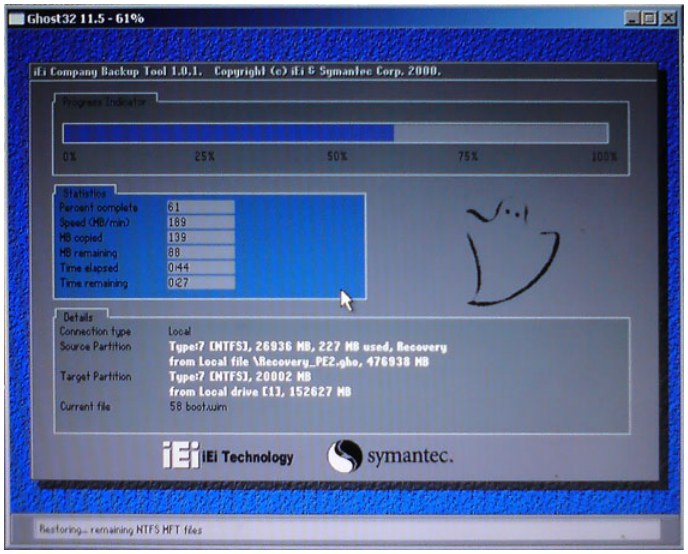


Figure B-26: Building the Auto Recovery Partition

Step 7: After completing the system configuration, the following message prompts to confirm whether to create a factory default image. Type **Y** to have the system create a factory default image automatically. Type **N** within 6 seconds to skip this process (The default option is YES). It is suggested to choose YES for this option.

Figure B-27: Factory Default Image Confirmation

Step 8: The Symantec Ghost starts to create the factory default image (**Figure B-28**).

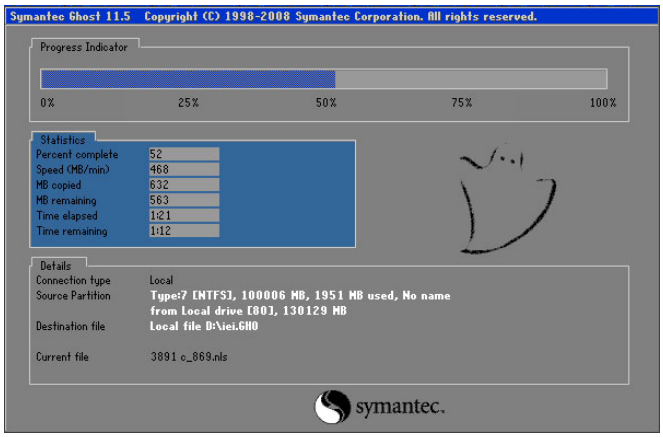


Figure B-28: Image Creation Complete

Step 9: After completing the system configuration, press any key in the following window to restart the system.

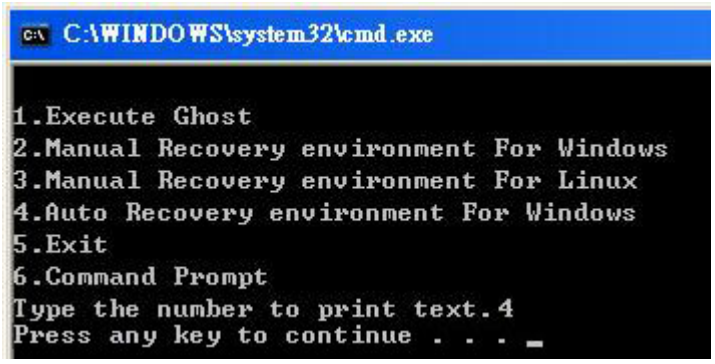


Figure B-29: Press any key to continue

Step 10: Eject the One Key Recovery CD and restart the system.

Step 11: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 12: Enable the Auto Recovery Function option (**Advanced → iEi Feature → Auto Recovery Function**).

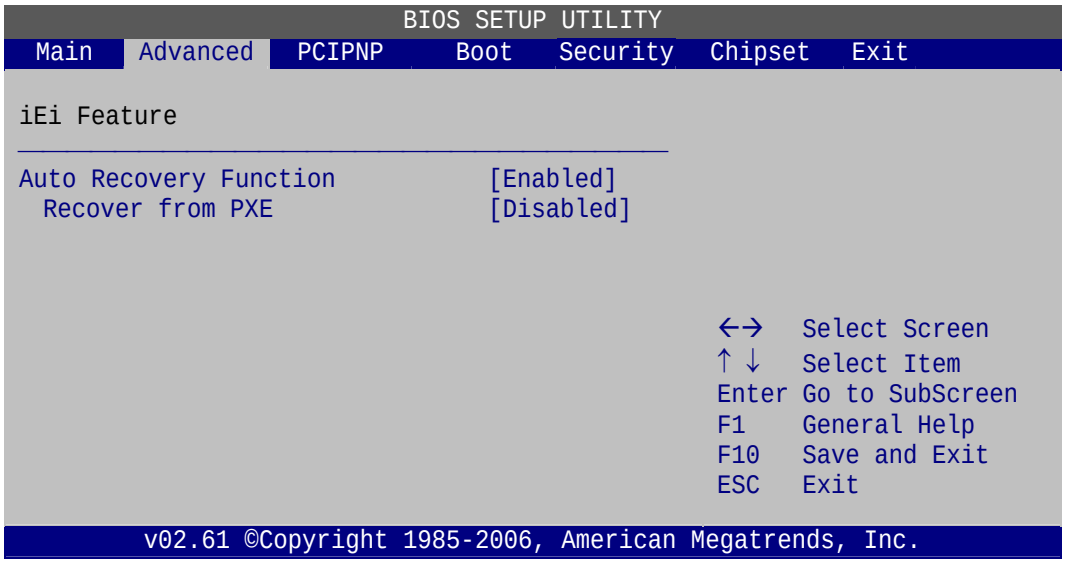


Figure B-30: IEI Feature

Step 13: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

B.4 Setup Procedure for Linux

The initial setup procedure for Linux system is mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section B.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: **/**
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.

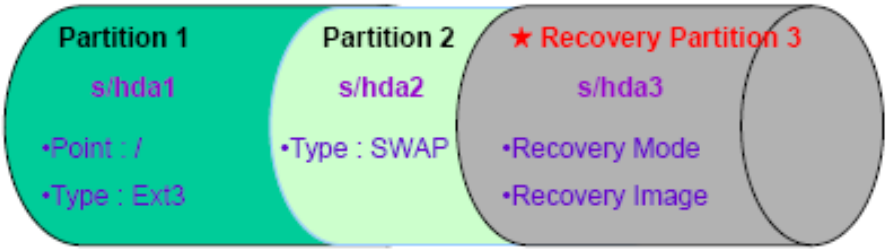


Figure B-31: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build the recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure B-32**). The Symantec Ghost window appears and starts configuring the system to build a

recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

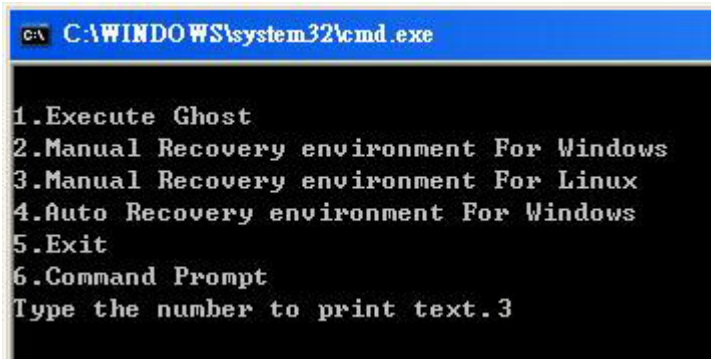


Figure B-32: Manual Recovery Environment for Linux

Step 5: **Access the recovery tool main menu by modifying the "menu.lst"**. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

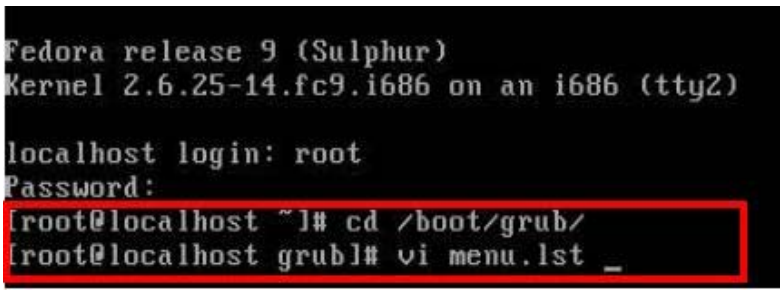
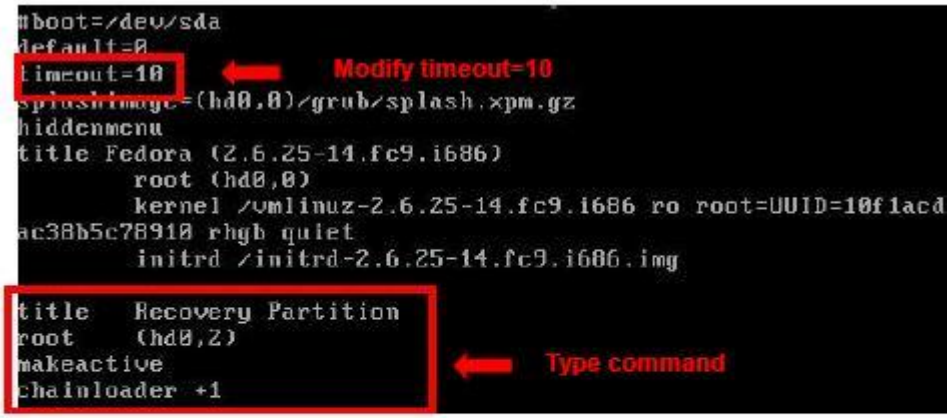


Figure B-33: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.



- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure B-34**)

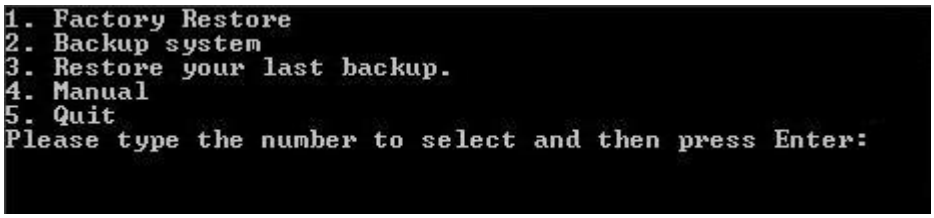

1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:

Figure B-34: Recovery Tool Menu

Step 8: **Create a factory default image**. Follow **Step 2** ~ **Step 12** described in **Section B.2.5** to create a factory default image.

B.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. However, if the setup procedure in Section B.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.

Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section B.2.5.
2. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup**: Restore the last system backup image
4. **Manual**: Enter the Symantec Ghost window to configure manually.
5. **Quit**: Exit the recovery tool and restart the system.

WARNING:

Please do not turn off the system power during the process of system recovery or backup.

WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

B.5.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

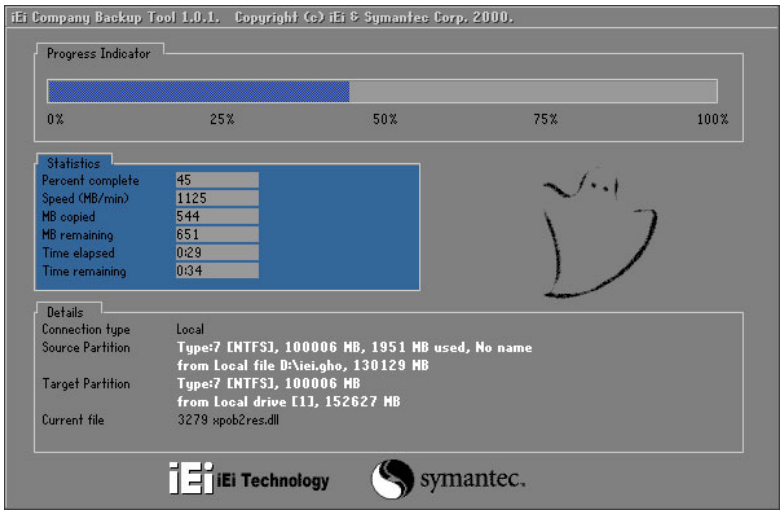


Figure B-36: Restore Factory Default

Step 3: The screen shown in **Figure B-37** appears when completed. Press any key to reboot the system.

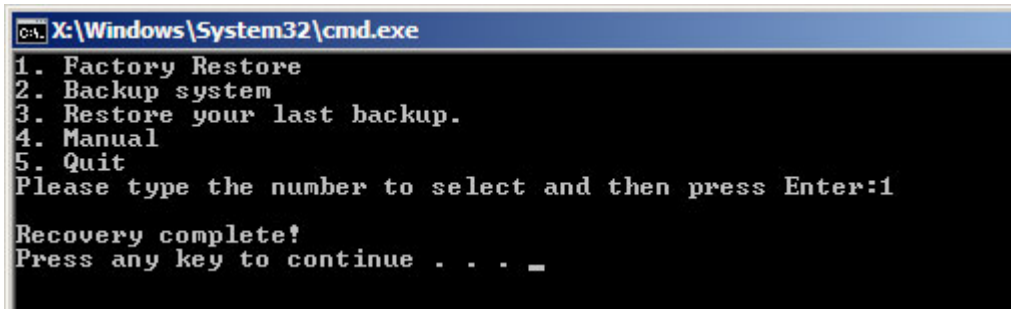

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:1
Recovery complete!
Press any key to continue . . .

Figure B-37: Recovery Complete Window

B.5.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

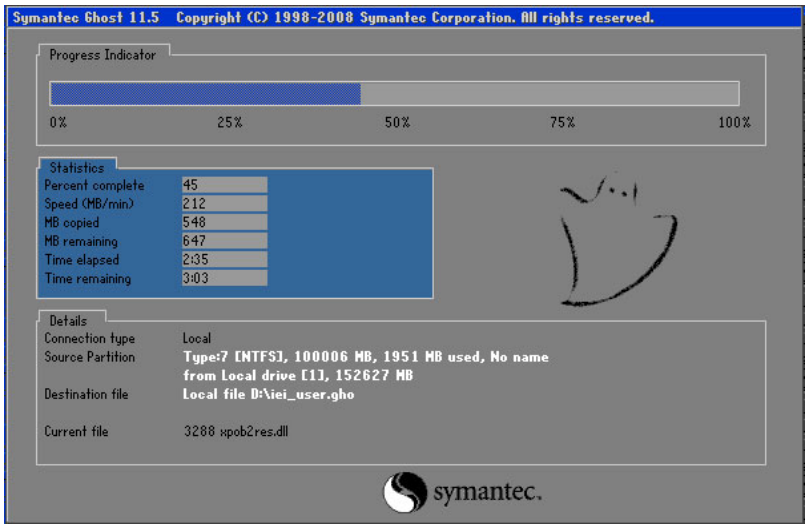


Figure B-38: Backup System

Step 3: The screen shown in **Figure B-39** appears when system backup is complete. Press any key to reboot the system.

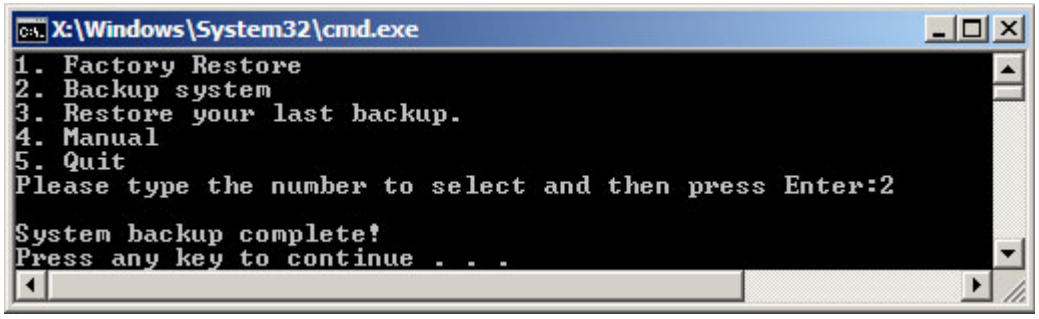

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:2
System backup complete!
Press any key to continue . . .

Figure B-39: System Backup Complete Window

B.5.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <**3**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

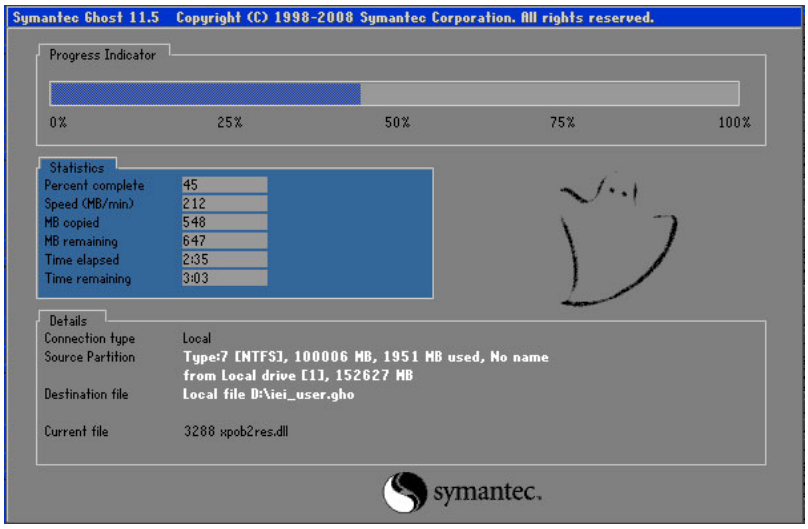


Figure B-40: Restore Backup

Step 3: The screen shown in **Figure B-41** appears when backup recovery is complete. Press any key to reboot the system.

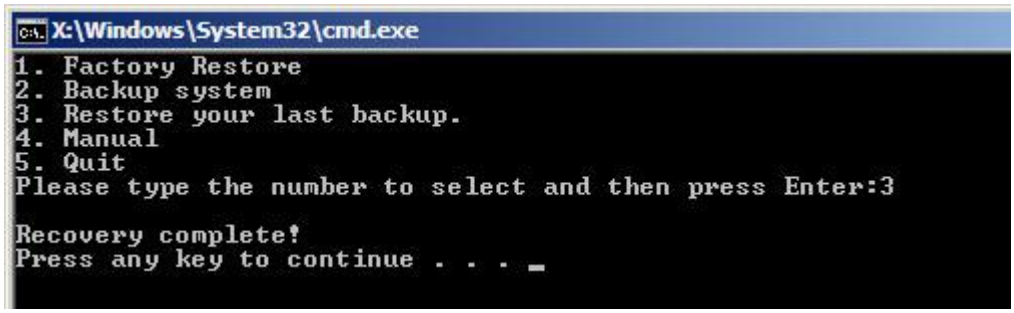

X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:3
Recovery complete!
Press any key to continue . . .

Figure B-41: Restore System Backup Complete Window

B.5.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

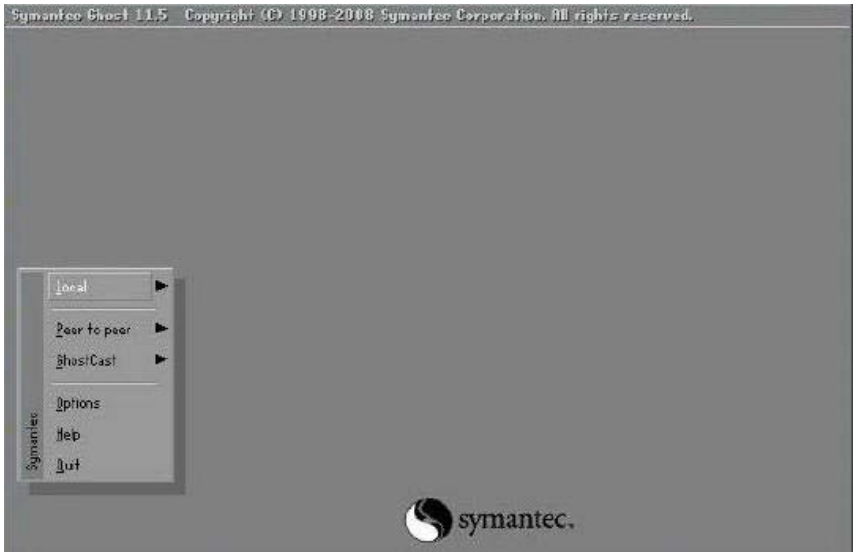
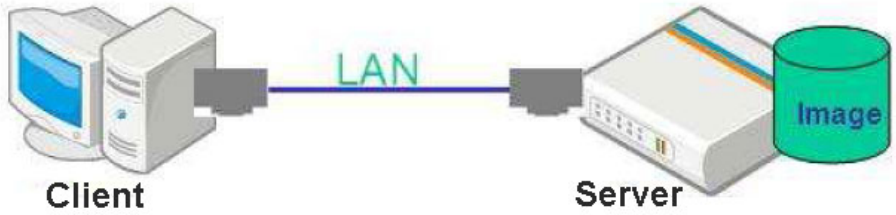


Figure B-42: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

B.6 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.



CAUTION:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

Prior to restoring client systems from a Linux server, a few setup procedures are required.

Step 1: Configure DHCP server settings

Step 2: Configure TFTP settings

Step 3: Configure One Key Recovery server settings

Step 4: Start DHCP, TFTP and HTTP

Step 5: Create a shared directory

Step 6: Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

B.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

#yum install dhcp (CentOS, commands marked in red)

#apt-get install dhcp3-server (Debian, commands marked in blue)

Step 2: Confirm the operating system default settings: dhcpd.conf.

CentOS

Use the following command to show the DHCP server sample location:

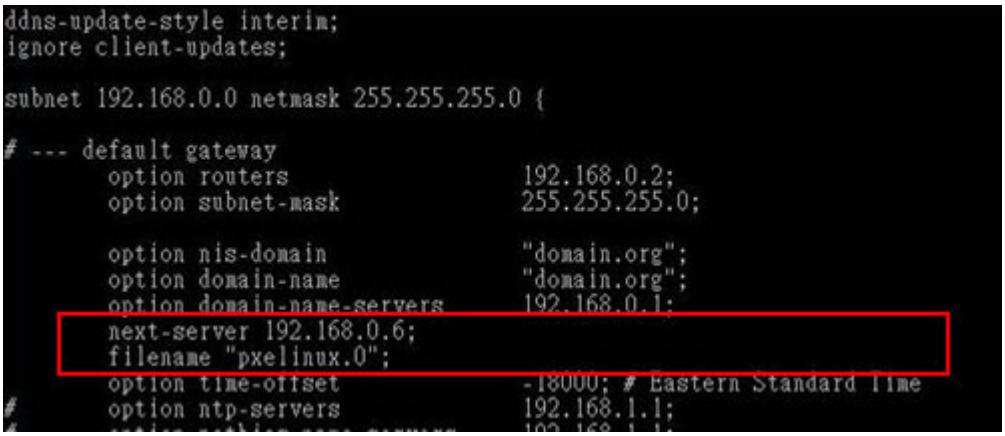
#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf

#vi /etc/dhcpd.conf



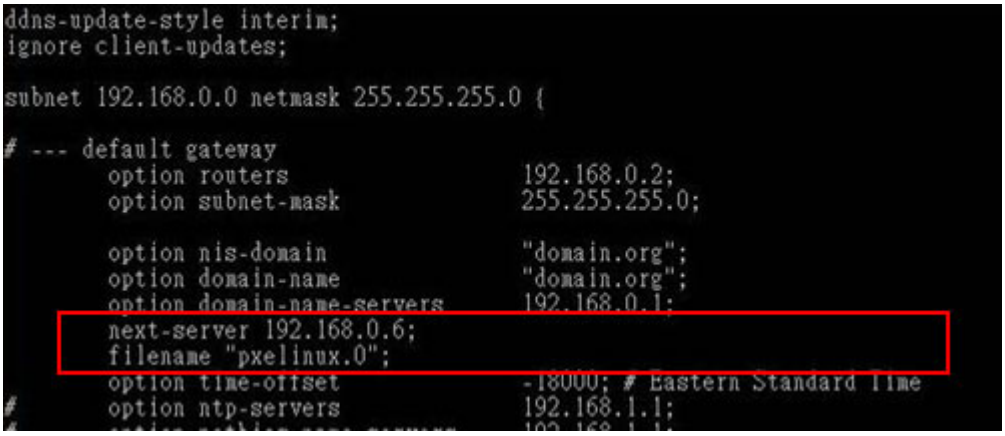
Debian

#vi /etc/dhcpd.conf

Edit “/etc/dhcpd.conf” for your environment. For example, add

next-server PXE server IP address;

filename “pxelinux.0”;



B.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

#apt-get install tftpd-hpa xinetd syslinux (Debian)

Step 2: Enable the TFTP server by editing the “/etc/xinetd.d/tftp” file and make it use the remap file. The “-vvv” is optional but it could definitely help on getting more information while running the remap file. For example:

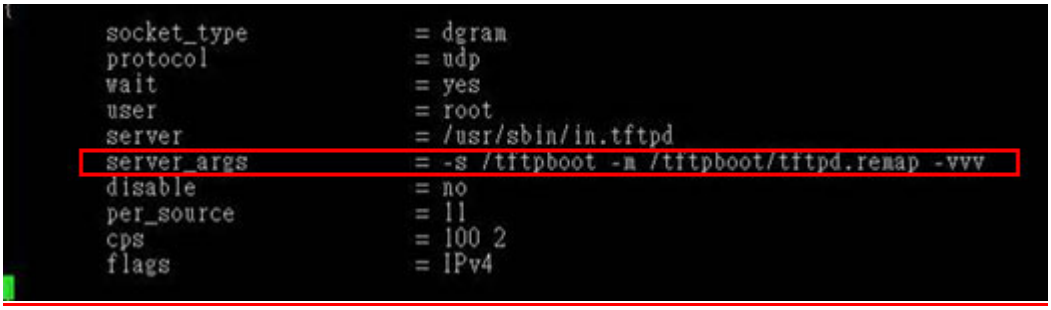
CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

server_args = -s /tftpboot –m /tftpboot/tftpd.remap -vvv_

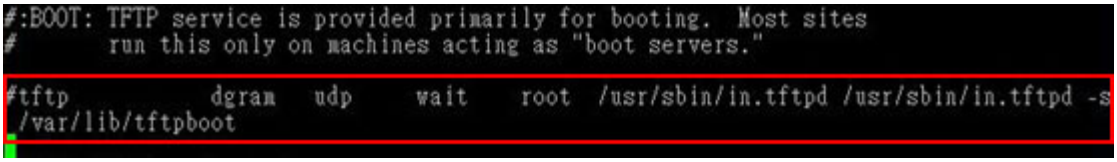


Debian

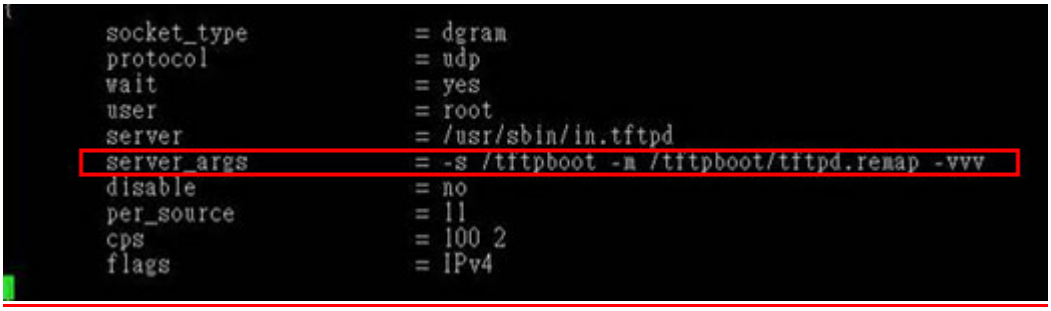
Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

#vi /etc/inetd.conf

Modify: #tftp dgram udp wait root /usr/sbin..... (as shown below)


#:BOOT: TFTP service is provided primarily for booting. Most sites
run this only on machines acting as "boot servers."
#tftp dgram udp wait root /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
/var/lib/tftpboot

#vi /etc/xinetd.d/tftp



B.6.3 Configure One Key Recovery Server Settings

Step 1: Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).

Step 2: Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

Step 3: Copy “pxelinux.0” from “syslinux” and install to “/tftboot”.

#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/

B.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

#service xinetd restart

#service httpd restart

#service dhcpd restart

Debian

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

#/etc/init.d/dhcp3-server restart

B.6.5 Create Shared Directory

Step 1: Install the samba.

#yum install samba

Step 2: Create a shared directory for the factory default image.

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

WARNING:

The file name of the factory default image must be **iei.gho**.

Step 3: Confirm the operating system default settings: smb.conf.

#vi /etc/samba/smb.conf

Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

Step 4: Edit “/etc/samba/smb.conf” for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
   security = share
```

```
[image]
   comment = One Key Recovery
   path = /share/image
   browseable = yes
   writable = yes
   public = yes
   create mask = 0644
   directory mask = 0755
```

Step 5: Modify the hostname

#vi /etc/hostname

Modify: RecoveryServer

```
RecoveryServer
~
```

B.6.6 Setup a Client System for Auto Recovery

Step 1: **Disable the automatically restart function before creating the factory default image**. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See Figure B-23)

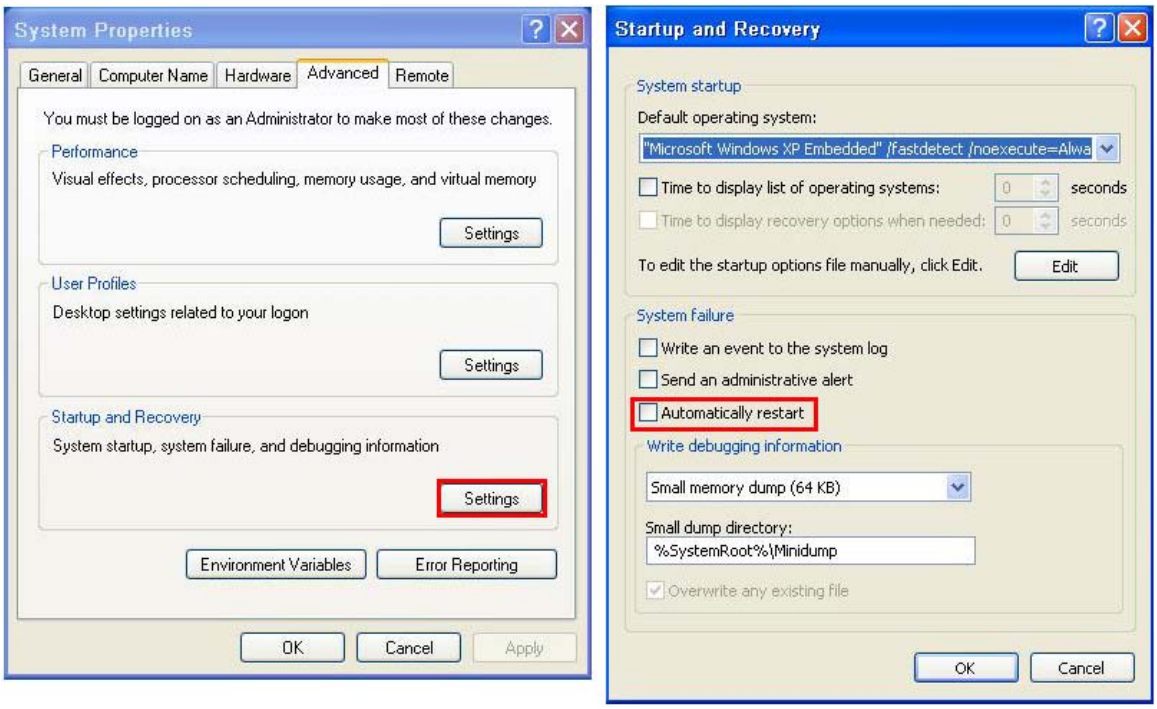


Figure B-43: Disable Automatically Restart

Step 2: Configure the following BIOS options of the client system.

Advanced → iEi Feature → Auto Recovery Function → **Enabled**

Advanced → iEi Feature → Recover from PXE → **Enabled**

Boot → Launch PXE OpROM → **Enabled**

Step 3: Continue to configure the **Boot Option Priorities** BIOS option of the client system:

Boot Option #1 → remain the default setting to boot from the original OS.

Boot Option #2 → select the boot from LAN option.

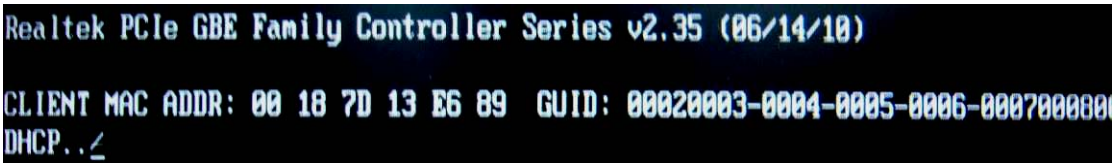
Step 4: Save changes and exit BIOS menu.

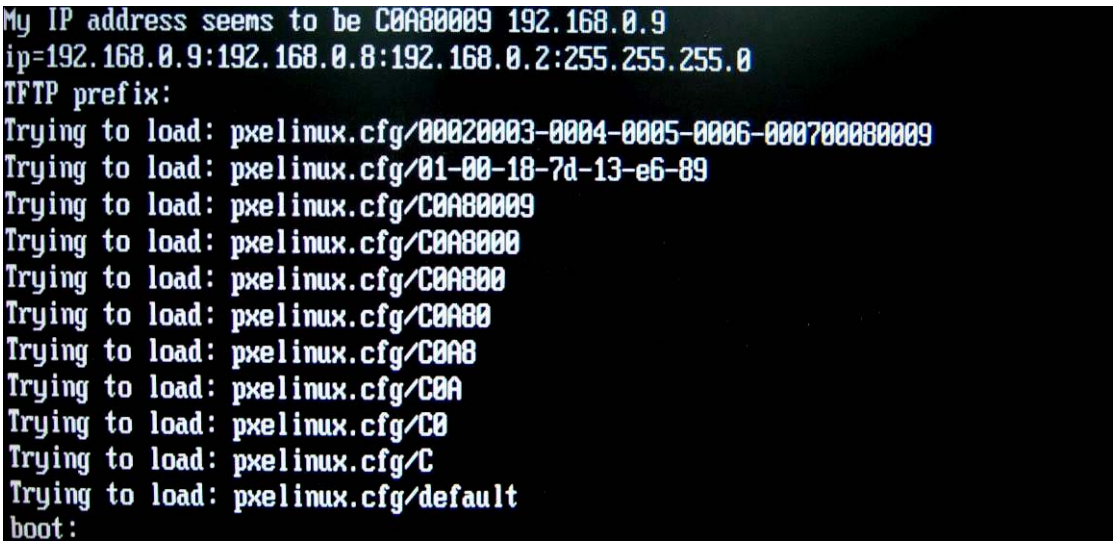
Exit → **Save Changes and Exit**

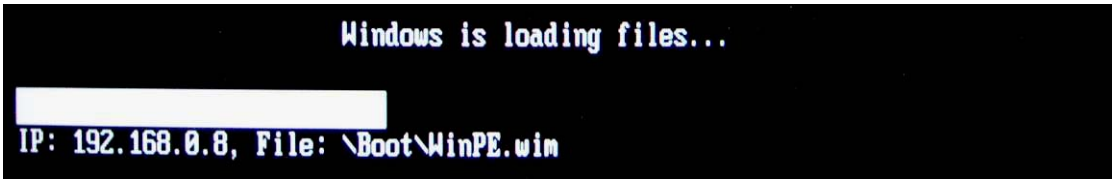
Step 5: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility

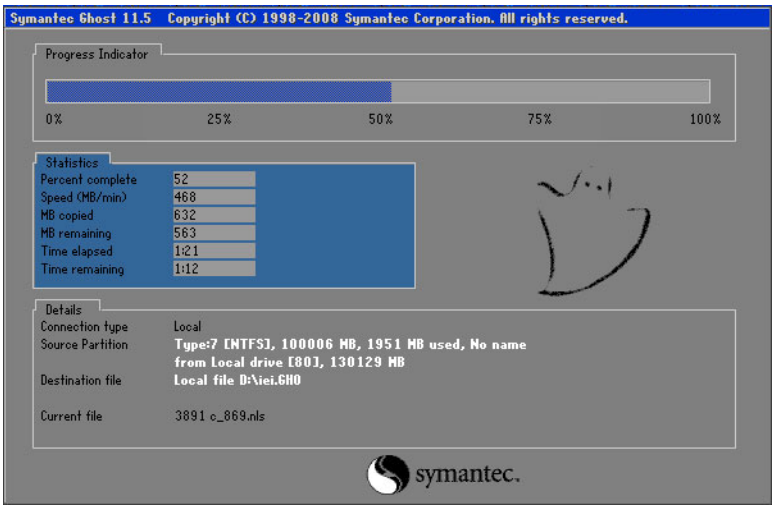
MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.


Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89 GUID: 00020003-0004-0005-0006-000700080
DHCP..







NOTE:

A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

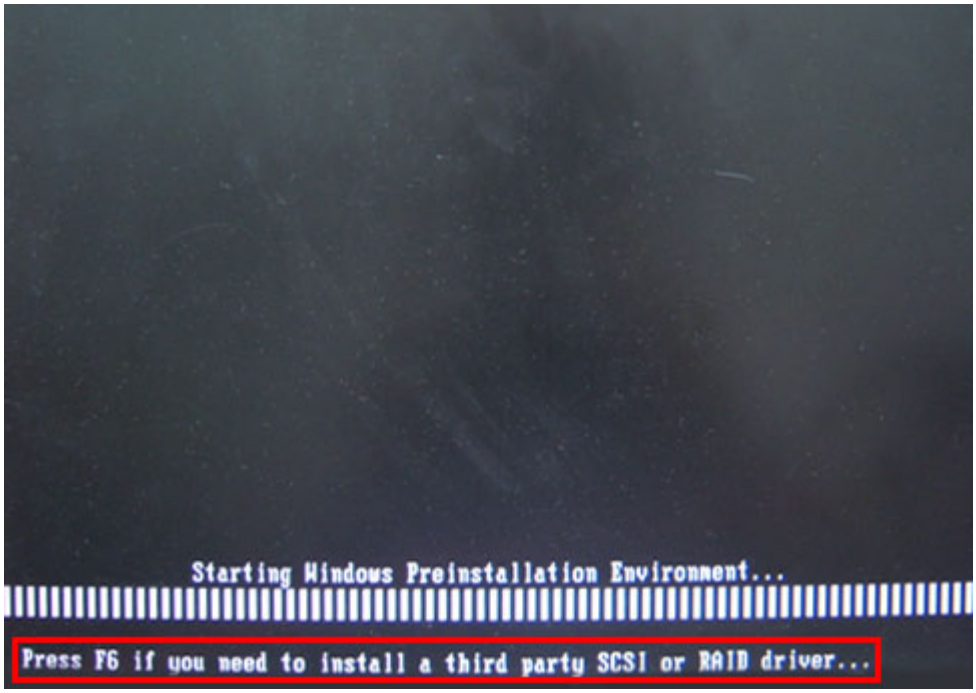
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

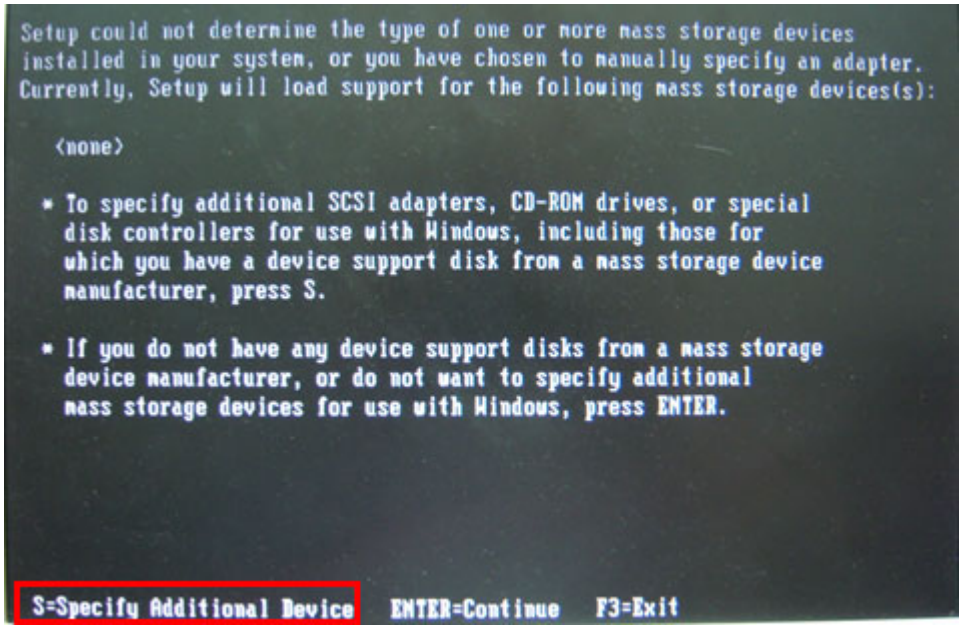
Step 2: Connect the USB floppy disk drive to the system.

Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

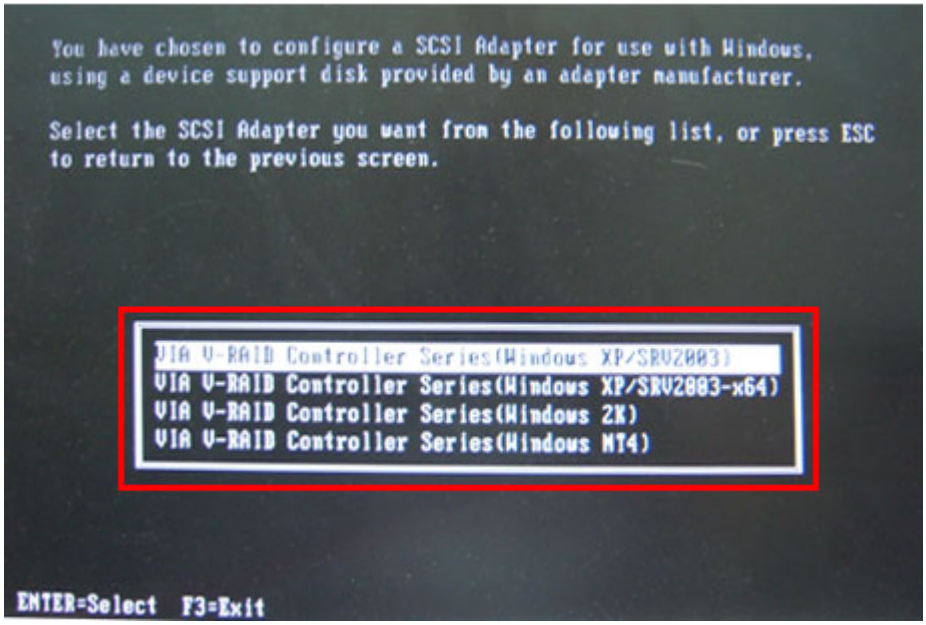
Step 4: When launching the recovery tool, press <**F6**>.



Step 5: When the following window appears, press <**S**> to select “Specify Additional Device”.


Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Device
ENTER=Continue
F3=Exit

Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.


You have chosen to configure a SCSI Adapter for use with Windows,
using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC
to return to the previous screen.
VIA V-RAID Controller Series(Windows XP/SRV2003)
VIA V-RAID Controller Series(Windows XP/SRV2003-x64)
VIA V-RAID Controller Series(Windows 2K)
VIA V-RAID Controller Series(Windows NT4)
ENTER=Select F3=Exit

Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

B.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Appendix

C

Terminology

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the KINO-QM770 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

D.2 DIO Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	D_IN0	4	D_OUT0
5	D_IN1	6	D_OUT1
7	D_IN2	8	D_OUT2
9	D_IN3	10	D_OUT3
11	D_8IN0	12	D_8OUT0
13	D_8IN1	14	D_8OUT1
15	D_8IN2	16	D_8OUT2
17	D_8IN3	18	D_8OUT3

Table 6-1: Digital I/O Connector Pinouts

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

```
MOV        AX, 6F08H      Sets the digital port as input
```

INT	**15H**	Initiates the INT 15H BIOS call

D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						